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ABSTRACT

Educational research in Asia and the Pacific is examined from the perspective of reform in instructional content and method. Information based on speeches and discussion at a regional workshop held in Japan in 1982 is presented in four chapters. Chapter 1 explains workshop objectives, introduces participants, and presents a general overview of the agenda. Chapter 2, a presentation of patterns and directions in educational reform, is subdivided into sections on infrastructure, reform implementation, and diffusion. Issues identified include financial problems, paucity of trained research personnel, lack of coordinated research efforts, credibility of research, lack of evaluation techniques, teacher participation, and methods of dissemination. Chapter 3 outlines research strategies related to implementation and evaluation of instructional content and methods. Issues are discussed under the categories of preparation strategies, participation strategies, anticipatory strategies, and evaluation strategies. The final chapter recommends specific actions regarding research, professional training, and strengthening of the role of UNESCO. The bulk of the document consists of four appendices which contain a list of workshop participants, individual papers presented at the workshop, papers prepared by resource persons, and a visit to a secondary school by workshop participants. (LP)

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UNESCO-NIER REGIONAL PROGRAMME

RESEARCH AND EDUCATIONAL REFORM

Problems and Issues, and Strategies for Resolving Them

U.S. DEPARTMENT OF EDUCATION
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Report of a Regional Workshop

4 — 17 November 1982

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Chapter I

INTRODUCTION

Background

In 1979 the National Institute for Educational Research (NIER) of Japan and Unesco organized jointly a Regional Seminar on Educational Research in relation to Educational Reform in Asia and Oceania. The participants of this seminar stressed the importance of training educational research workers and the significance of educational research in the implementation of educational reforms. To advance the first of these requirements NIER jointly with Unesco organized a further regional seminar in 1981 to discuss the training of young educational researchers. The present workshop takes up the second recommendation of the 1979 meeting, in bringing a sharper focus on educational research in relation to the implementation and evaluation of reforms of educational content and methods.

At the twenty-first session of Unesco's General Conference, the Secretariat was authorized to strengthen and reorient educational research and in particular to organize a regional workshop. Upon receiving a request from Unesco, NIER agreed to act as host for the workshop which was to take place within the framework of the Asian Programme of Educational Innovation for Development (APEID).

APEID is a regional co-operative Unesco programme in which all of the Asian and Pacific Member States are invited to participate. Through the APEID network its members pool and exchange knowledge and techniques in education and thus aid development in the region.

In planning the Workshop NIER has collaborated with the Unesco Regional Office for Education in Asia and the Pacific and its Asian Centre of Educational Innovation for Development (ACEID). In addition, NIER has benefited from the co-operation given by the Japanese National Commission for Unesco and the Ministry of Education, Science and Culture of Japan.

Objectives of the Workshop

The objectives of the Workshop were:

1) To review and exchange experiences on the development of research

related to the implementation and evaluation of reforms of educational content and methods;

2) To identify crucial issues and problems in this regard;
3) To evaluate research activities and their impact on new developments in this area; and
4) To suggest important area in which there is a need to further develop research for undertaking reforms of educational content and methods.

Participation

The workshop was attended by eighteen participants from sixteen countries and four resource persons namely; Dr. Yung Dug Lee (Republic of Korea), Dr. S. K. Mitra (India), Mr. Chin Pin Seng (Malaysia) and Dr. Liceria B. Soriano (Philippines). Unesco was represented by Dr. A. Latif, Chief of the Asian Centre of Educational Innovation for Development (ACEID) Bangkok. In addition, Mr. M. Oka from Sakaide Lower Secondary School attached to Kagawa University was an observer. A list of all participants and the NIER secretariat is included in Appendix I.

Inauguration

In warmly welcoming the participants and resource persons to the workshop Mr. Kida, Director General, National Institute for Educational Research of Japan, spoke of the importance of enhancing the research capabilities of the countries represented. Such enhancement he indicated, should improve the quality and innovativeness of education. In previous meetings held at NIER, much value had been attached to school based research and development. The emphasis upon improving the research capability of individual teachers has been seen as a means of promoting classroom instruction that would be more vivid, creative and meaningful. However for the present workshop, the focus was to be on research which helped to reform educational content and methods. Thus research projects centering around classroom instruction or involving classroom teachers, Mr. Kida suggested, were to be the focus of special attention. After thanking the Unesco Regional Office for Education in Asia and the Pacific and the Ministry of Education, Science and Culture in Japan for their support Mr. Kida declared the workshop open, and wished the participants success in their discussions.

Both Mr. Noboru Noguchi of the Ministry of Education, Science and Culture in Japan and Dr. A. Latif, from Unesco, Bangkok, added to Mr. Kida's welcome to members of the workshop. In doing this Mr. Noguchi drew attention to APEID's unique network approach to which twenty one Unesco Member States are currently participating. He pointed out that APEID had become the examplar of co-operative enterprise for other regions around the world.

Every year the Japanese National Commission for Unesco and the Ministry of Foreign Affairs provide financial support for the various activities of APEID. Currently, educational technology, vocational and technical education, science education, curriculum development and special education for the handicapped are the five areas that are receiving attention.

Mr. Noguchi pointed out that regional seminars or workshops had been organized regularly by NIER and Associated Centres of APEID in Japan.

Dr. Latif in addressing the workshop briefly touched on the history of APEID and cited the recommendations of the Asian members who had planned, implemented and supervised activities for the region. New strengths had been brought to the programme and new dimensions added, he believed, with the joining of Pacific countries in the network.

The recent Manila meeting of the Regional Advisory Committee invited special attention to future orientations and preferential treatment of disadvantaged groups. This report, together with earlier statement made by APEID and the draft Second Medium Term Plan (1984-89) indicated the growing concern of Unesco Member States with building up the research base for designing and implementing education reforms and innovations. In particular, Dr. Latif stressed the importance of 'feeding forward' the results of research to influence the future curriculum of schools.

In concluding his comments, Dr. Latif thanked Mr. Kida for his leadership and the staff of NIER for their valuable contribution, and wished the participants well in their deliberations.

Officers of the Workshop

The workshop elected the following office bearers:

Chairperson: Dr. Sim Wong Kooi (Singapore)
Vice Chairperson: Dr. Prem Kumar Kasaju (Nepal)
Rapporteurs: Dr. Juanita S. Guerrero (Philippines)
Dr. Graham J. Whitehead (Australia)

Context of Education in the Region

The participants of the workshop had been drawn from countries with rich traditions but different cultural heritages. Most of the countries contain groups of people drawn from varying ethnic origins, often reflecting different values and, communicating in languages different from other members of their society.

Some countries cover large land masses while others are made up of small islands, sometimes spread over wide geographical areas. In general, these countries have large populations, not always evenly distributed between geographical regions. The bulk of people live in rural areas where access to sophisticated

technology and the mass media cannot always be taken for granted.

Each country has experienced, to different degrees, the impact of technology. At least one country has been a major contributor to the rapid advances in technology experienced around the world.

Universal education and equal access to primary education continue to be major national objectives not yet fully achieved in several countries represented at the workshop. It was evident that success in achieving these objectives has not been as rapid as planned nor has the retention rates of students in schools in several countries matched the expectations of educational planners.

All countries are concerned about the literacy and numeracy levels of their people and have programmes either to enhance these levels or to monitor student mastery of the skills involved. In particular, countries recognize the differing needs of various ethnic groups and the multi-cultural nature of their societies hence they have strengthened their efforts towards developing and reformulating language policies and producing programmes in support of such policies.

While all countries are addressing the problems of numeracy and literacy they also acknowledge the importance of other outcomes of education. Among these are the development of national values, the improvement of a child's ability to make moral judgements, and the widening of his or her understanding of the world of work.

National curricula are developed in many countries to achieve national goals. The designed curricula are distributed to schools and teachers who are expected to implement them. Other countries, give greater responsibility to schools to develop specific programmes that will suit the learning characteristics of their students in their various stages of development. Such programmes must be designed to fit within the parameters or guidelines issued by Ministries or Departments of Education. These guideline statements list broad objectives to be achieved through schooling and frequently indicate time allocations between subject areas but teaching methods and sequencing of content are commonly left to the teachers implementing the total programme.

This brief statement illustates some of the differences and similarities existing among the various countries represented at the workshop. Moreover, it is a reminder of the complex contexts from which educational problems and issues emerge. Of equal importance, within these same contexts is that solutions must be applied. Educational researchers ignore them at their peril. While many countries share the same general educational problems, the practical solution in one setting may need radical modification to be successful in another. Yet by sharing possible solutions to existing problems new insights will be generated for application in different situations.

Educational Research in the Region

Prior to coming to the workshop, each participant had prepared a short paper describing on-going or recent research into implementation and evaluation of reforms in content and methods of education in his or her country. (Abridged versions of these papers are included in Appendix II). The purpose of these papers was to provide a bases for discussing problems and issues in research and possible strategies for resolving them. In addition, papers prepared by the four resource persons were also circulated. (See Appendix III)

An examination of all papers reveals a wide range of investigations being undertaken throughout the region. The purposes of the studies vary as do methodologies used. Some set out to collect basic data on achievement levels of students in subjects of the school curricula. Some were concerned with developing and validating new evaluation instruments to be used by teachers and researchers. There are studies which aimed to test the feasibility of proposed new initiatives in education before they are disseminated to all schools in a district or nation. Yet others explore the diffusion of curriculum innovation and assess its impact upon schools. Attention has also been given to policy research to assist administrators make decisions about the future provision of education in their country and to help them allocate physical and human resources.

In terms of methodology, some studies adopt the traditional or classical psychological paradigms with an emphasis upon the collection of quantitative data. Others use an action research model. With the latter group of studies emphasis is given to the social nature of research with participants in the action being involved in the planning and implementation of the proposal. Data collected in these instances is often impressionistic. Hence most researchers engaged in Research and Development projects, so as to avail themselves of as many data sources as possible and to reduce systematic bias, use a combination of the qualitative and quantitative methods whenever appropriate.

When undertaking these studies researchers have used a wide range of instruments and evaluation techniques. These include standardized and criterion referenced tests, interviews, classroom observation schedules, questionnaires, student writing, diaries and other unobtrusive methods.

Most studies reported directed attention at the primary level of schooling but there are studies exploring research questions at the secondary and the tertiary levels of education. The number of language studies included in the reports reflects the priority of governments in the region. However studies in mathematics, science, handwriting, national culture and other subject areas are represented.

Clearly there is a commitment to research in the region. Many tertiary institutions, research and development centres and government departments or ministries are involved in research activities. Those involved are actively engaged in the systematic collection of data, which will help decision-making by

administrators, schools, parents and students.

Final Session

The draft of the final report was presented and adopted at the closing session on the last day of the workshop. The suggested modifications and corrections made during then session have been incorporated in this final report.

Mr. Yokoo, Deputy Director General of NIER in closing the workshop conveyed his thanks and that of Mr Kida to all those who had participated. He said that NIER would continue its efforts in supporting educational research activities in the region and would pay close attention to the recommendations of the workshop.

Chapter II

Problems and Issues: Patterns and Directions

Research studies on the implementation and evaluation of content and methods in the countries of the region are undertaken in different settings, by individuals and groups of different capabilities and persuasions. Nevertheless, while studies vary in type, magnitude and purpose between countries, there are many problems and issues of common concern. Through discussions by participants at the workshop, the problems and issues associated with research into the implementation and evaluation of educational reforms were highlighted and noted.

In order to aid the presentation and to reveal patterns and trends these problems have been classified somewhat arbitrarily into three groups. The categories are entitled *Infrastructure or Getting Started, Involvement or Doing It, and Insights or Spreading and Using It.* Figure 1, summarises the problems and issues under these three headings. The figure also includes a classification scheme for strategies, discussed in Chapter Three, that might be used to overcome the problems.

A. Infrastructure: Getting Started

Many participants indicated problems which refer to administrative difficulties as well as to those which are found during the pre-planning stage of the implementation and evaluation of content and method. It may be well to remember that administrative mechanisms as well as the stage of development of educational research in countries differ. However, inspite of these differences, problems relevant to infrastructure, or those related to the pre-planning stage are similar.

In the majority of countries represented at the workshop, traditions in educational research have barely been established. It should be noted that, unlike research in the physical sciences, educational research does not have a history spread over several centuries. Yet, the expectations of the members of the educational community of the contribution that research should make to educational practice, and the consequential improvement of society and the living standards of the people, is extremely, if not disproportionately, high. Currenty, there are several constraints which inhibit research making its desired contribution.

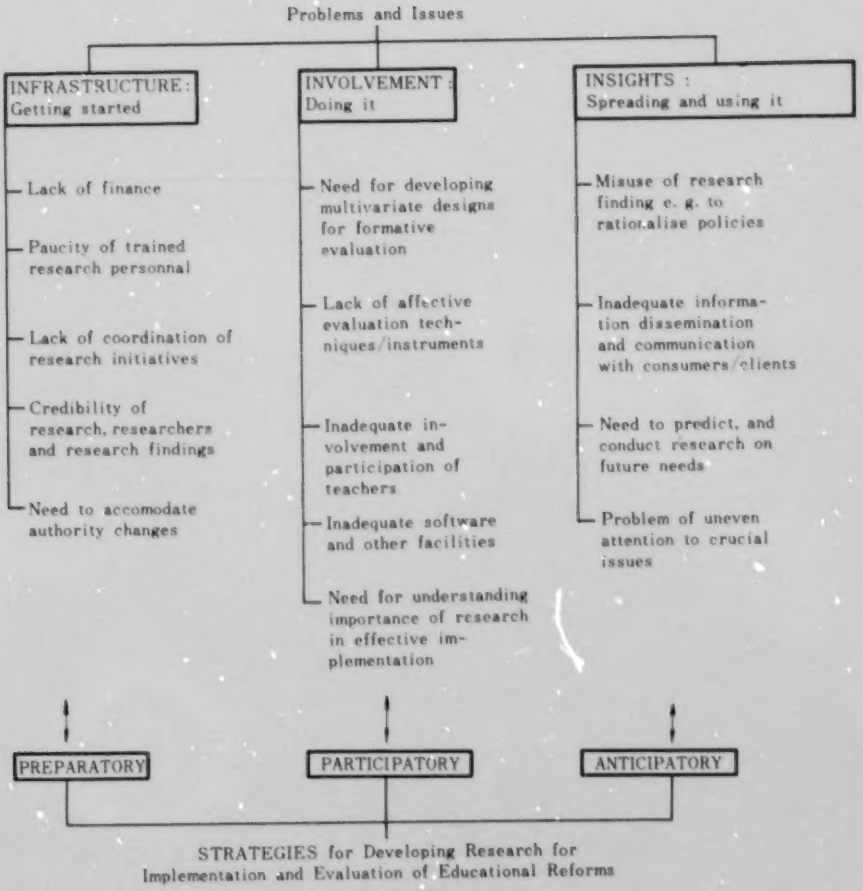
Problems and Issues
INFRASTRUCTURE: Getting started
INVOLVEMENT: Doing it
INSIGHTS: Spreading and using it
Lack of finance
Paucity of trained research personnal
Lack of coordination of research initiatives
Credibility of research, researchers and research findings
Need to accomodate authority changes
Need for developing multivariate designs for formative evaluation
Lack of affective evaluation techniques/instruments
Inadequate involvement and participation of teachers
Inadequate software and other facilities
Need for understanding importance of research in effective implementation
Misuse of research finding e. g. to ratioralise policies
Inadequate information dissemination and communication with consumers/clients
Need to predict, and conduct research on future needs
Problem of uneven attention to crucial issues
PREPARATORY
PARTICIPATORY
ANTICIPATORY
STRATEGIES for Developing Research for Implementation and Evaluation of Educational Reforms

Figure 1: Summary of Problems and Issues in Developing Research, and their Relationship to Possible Strategies

1. Lack of finance:

In many of the countries of the region educational research seems to be in its early stages of development. Allocation of resources for research seems to be given low priority, in comparison with other sectors of education, as well as other non-educational sectors like health, welfare, transport and defense. Such a situation makes it difficult for educators to conduct appropriate research into development of content and methods. In many cases, the pattern seems to be to resort to funding agencies, either foreign or non-governmental, for research grants in order that studies on the implementation and evaluation of content and methods may be conducted.

2. Paucity of trained research personnel:

Educational issues are complex and constantly changing. To be able to explore them successfully requires the adoption of appropriate research designs, the careful delineation of the problems to be examined, the use of valid data-gathering instruments and techniques, the employment of sophisticated data analysis procedures, and skill and experience in the application of results to the school situation. All these tasks require the employment of people who are well-trained in relevant research methodologies and who have a clear perception of the role of research in schools. Unfortunately such people are few in the region. Often, trained people are found in the colleges and universities, but because they are fully occupied in teaching, they are usually not available for research on the implementation and evaluation of content and methods. If they are available, they do so only on a part-time basis, which hardly meets the needs of the countries for research-based implementation of the educational reforms envisaged.

3. Lack of coordination of research initiatives:

Given the limited funds available for research and the lack of sufficient trained personnel, there appears to be unnecessary duplication of some studies, within countries in the region. Each member country represented at the workshop has several institutions undertaking educational research that is relevant to schools. But co-ordination of investigations tend to be unsystematic and unplanned. Much is left to the informal network of information formed among individual researchers. Although research bodies exist, it seems that in a majority of cases, the proliferation of similar research have been observed, while some areas have been sadly neglected.

4. Credibility of research, researchers and research findings:

Many participants pointed out that administrators and teachers tend to question the credibility of educational research and do not see its value in the implementation of reforms. They attributed it to the fact that the implementors are often not involved in the conduct of research and that there is considerable room for improvement in the quality of research. Very often, the implementors are not even aware of the research conducted, and when the results are generated by the researchers, they question the validity of the results.

Sometimes, the expectations of research are unrealistic. Results frequently have to be couched in tentative terms because the researcher is aware of barely adequate response levels to a questionnaire, or because the data collected fails to meet all the prerequisites for planned statistical analyses, or because deficiencies in an observational schedule were recognised "post hoc" or for some other reason. The best designed experimental study which shows a significant mean difference between groups is only hypothesis generating for the classroom teacher. No particular class is likely to be equivalent to classes drawn at random to be included in the experimental group and no teacher is likely to present an exact parallel of the research treatment. And yet, the client of the research is usually seeking a definitive answer to a problem he has at hand and is disillusioned when he does not get one.

Reports, when presenting the answer to one problem, commonly identify additional problems that require investigation. On many occasions, statistically significant results fail to materialize when people are convinced they should exist. In some detailed and lengthy investigations, the results are seen to be no more than what would be expected using common sense. When results of research are incomprehensible to teachers and appear to lack relevance to the prime purpose of schooling, namely to assist students achieve their full potential as human beings, the credibility of the research is challenged.

5. Need to acommodate authority changes:

Conducting research in education is a time consuming task. It takes time to plan, to prepare instruments, to gather data, to analyze responses, to write research report and to disseminate the results. Yet, there is a tendency in the region for those who commission the research initially to be very mobile in their jobs. Ministers of Education change portfolios and administrators are redeployed to tackle new tasks. The research commissioned by one authority may not be of interest or concern to his or her successor in that position. Consequently, research which have been planned, started or on-going are hampered, delayed or even aborted prematurely. This problem is linked to the lack of clear, comprehensive, consistent and long-time plans for education within which administrators and researchers must operate.

B. Involvement: Doing It

This category includes all problems related to the technical aspects of research preparation, implementation and evaluation. It also covers all those problems and issues pertinent to the organization, coordination and involvement of all entities concerned. In a capsule, it covers all the problems met in doing the research which often arise from the lack of adequate and appropriate involvement of all parties concerned. In this category, the following are included:

1. *Need for the development of multivariate research designs for evaluation of the formative type:*

Educational research required for implementation of educational reforms in content and methods usually calls for multivariate designs whereas formative research in many cases, does not have access to such designs to take care of the complexity of the projects being undertaken. To add to this, it was pointed out by some participants that new inputs are added during the course of development of a project which the research design originally formulated had not taken into account. Usually, educational research in the implementation and evaluation of content and methods particularly, is taken as a one-shot solution rather than as a continuous process. Hence, there is no provision for evaluation, analysis, revision and improvement during the course of the project.

2. *Lack of evaluative technigues and instruments for the evaluation of the affective outcomes of education:*

Among the countries participating in the workshop, there was a consensus on the need to focus on moral education and particularly on development of values, humanism and other aspects in the affective domain. In this connection, the participants felt a dearth of valid instruments for measuring the learning outcomes of content and methods used in education for values. Any attempt to develop instruments in this direction will be very useful to the region.

3. *Inadequate involvement and participation of teachers:*

It was agreed that the key persons in the implementation and evaluation programmes of content and methods, are the teachers. Yet in most countries, they are rarely involved in the processes of planning, development and evaluation, let alone research. This is due to the fact that in most countries, the teachers are either not adequately prepared to conduct research, or they simply are too busy or too over-worked to be able to participate in research or in any other activity of a similar nature.

This is aggravated by the fact in most countries teachers are over-awed by research which hinders their participation. Furthermore, the present administrative arrangements in most participating countries do not provide for participation of teachers in research. Many university professors and lecturers, on the other hand, consider their academic research as more prestigious than research for implementation of reforms and hence they do not contribute as much to the quality of development and evaluation as they otherwise could and perhaps should.

4. *Inadequate availability of software and standard instruments for use with computers in research.*

Some participants identified a need for the development of software appropriate for use with computers now becoming increasingly available to the researchers. It was felt that while some standardized instruments and software are available they are not applicable to the developing countries in the region. So, standardized instruments and software packages developed on the basis of regional needs will be useful and valuable to countries in the region.

5. *Lack of understanding and appreciation about the importance of educational research for effective implementation of educational reforms by policy makers and other groups of clients:*

It was observed that planners, policy-makers and administrators in many countries of the region do not support educational research as much as it needs to be supported in order to make the implementation of educational reforms more effective. This is partly due to the fact that educational research findings, which might be useful in the formulation of policy, development of implementation strategies and, particularly, the evaluation of expected outcomes of reform, are not available in time, and, quite often, not appropriately conceived and executed. Besides, in some countries, policies change while research is being conducted, thereby reducing the utility of research.

One of the causes for this state of affairs is the fact that educational research lags behind policy changes. Research which is anticipatory in nature and intended to help policy makers make decisions are lacking. Moreover, there seems to be a need for understanding by policy makers of the nature of research activities especially with regard to timeliness and appropriateness of the existing situation.

C. Insights: Spreading and Using It

Problems in this group include those that are anticipatory in nature. The participants felt a need to entertain problems which are futuristic in nature. This is due to the fact that often, problems arise when they are not thought of in advance. The range of these problems may cut across the two categories, but if the

problem was due to lack of insights into the perceptions and requirements of prospective clients, then they are classified in this group. Among the problems included in this category are the following:

1. *Use of research findings to rationalize policies rather than using them as basis for decision-making on reforms:*

It has been noted in some countries in the region that when administrators and policy-makers feel a need to change content and methods, and time is running out on them, they tend to conduct, or commission research to justify the changes instead of utilizing the results as basis for identifying the reforms or changes that will be taken. While the misuse of research findings is completely beyond the control of the researcher, he or she should continue to strive for maximum objectivity and validity.

2. *Information dissemination and reporting inadequacy:*

There was a consensus among the participants that results of research in their countries often remain unused. The academic research conducted by individuals, institutions and/or centres of research are often not utilized by the educational system, and while content and methods are evaluated, results are hardly referred to. This may be due to the fact that reports are frequently prepared in a very technical form, such that lay people do not really understand them fully and therefore they are not used at all. Also, there was a feeling that if the researchers do not have linkages with the implemeting agencies, the findings of their work will not be used as inputs in the improvement of educational content and methods. Hence, the need to develop more effective communication of research findings to policy-makers and implementors alike was strongly emphasized.

3. *Predicting future research needs:*

This problem stems from the lack of mechanism, and a lack of comprehensive plans for identifying future research needs. What often happens is that the duration of a research project is not realistically planned and when research results are released, they are no longer useful. Besides the need for the right timing of research, there is also a need for research to anticipate likely problems associated with the implementation of educational reforms. Underlining each reform are assumptions regarding teaching-learning behaviours, as well as teacher education programmes and pedagogical content and methods, which need to be investigated.

4. Uneven attention to crucial issues:

A related problem in many countries has been, the relative lack of attention to certain less obvious, but crucial aspects of educational reform, such as the suitability of content and methods for different groups; rural-urban groups, various linguistic and cultural groups, and so on. The apparent distortion of the curriculum due to external examinations was another issue which some participants felt was in urgent need of investigation.

The foregoing problems are what the countries in the region face. Participants felt that the task of overcoming such constraints provides both a challenge and a stimulus for action. With such positive thoughts by participants coming from different countries in the region, it was felt that these problems should propel them to think of strategies necessary to handle them so that implementation and evaluation of content and methods may be improved.

Chapter III

Strategies for the Development of Research for Implementation and Evaluation of Content and Methods

There seems to be a common awareness among the various countries in the region of problems and issues inherent in the development of research for implementation and evaluation of content and methods. Such an awareness echoes a continuing concern for the recommendations given in previous ACEID-NIER seminars held in May-June 1979 (*Regional Seminar on Educational Research in Relation to Education Reform in Asia and Oceania*) and November 1981 (*Educational Research and Training in Asia and the Pacific*), that research be strengthened in every country and that the dissemination of research results to policy makers and to the educational community at large be encouraged and implemented in all countries.

In considering strategies for the development of research the participants at the workshop felt that strategies for the *evaluation* and *implementation* of educational reforms were equally important and can be subsumed under strategies for *research* and *development*. While suggested strategies are discussed in general terms in the present Chapter in order to underscore commonalities among countries in the region, specific variations do in fact occur. Likewise the specific type of research is likely to vary among, as well as within countries according to the situation-specific conditions or requirements. Using Vielle's typology,* for instance, depending on the kind of impact on educational change being envisaged for research, the type of research to be undertaken can fall into any of the following categories: (a) Disciplinary research; (b) Research for planning; (c) Instrumental research; (d) Action research; (e) Research on research, or (f) Documentary, bibliographical and statistical research.

Corresponding to the three main groupings of problems and issues in the previous Chapter, the suggested strategies have similarly been classified under three categories that are related along a time dimension. (See Figure I. page 8) Thus, the *Preparatory* strategies refer to the initial stages of preparing the

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* Vielle, Jean-Pierre, *The Impact of Research on Educational Change*, IDRC Manuscript Reports, June 1981.

groundwork for setting up an appropriate infrastructure which is conducive to the conduct of research. The *Participatory* strategies, however, relate to the involvement of every person concerned in the implementation and evaluation of educational reforms. Finally, the *Anticipatory* strategies are concerned with "feed forward" mechanisms of obtaining insights, which would help in the dissemination and utilization of research findings.

A. Preparatory Strategies

These strategies were proposed with an end in view of solving problems and issues which were mainly met during the initial phase of educational reforms. These problems were mainly infrastructure or administrative in nature and usually hinder the development of research for implementation and evaluation of content and methods.

1. Systematic development of a research programme within the context of the research and development process:

This strategy suggested that every country should organize a systematic plan of research for implementation and evaluation of content and methods by starting with baseline data, and following it up with in-depth studies through pilot studies, experimentation, case studies and possibly, futuristic studies which may help in making the proposed reforms relevant to the scenario of the not too distant future.

2. Comprehensive planning of educational reform:

This strategy suggests that in the development of ressearch it will be desirable to identify knowledge and skills to be developed in teachers and other educational personnel for the successful implementation and evaluation of reforms. It also means that in the preparation of these plans, such things as organization and management, infrastructure, as well as training and other inputs, costs and evaluation should be developed in great detail. Over and above these, the strategy suggests that involvement of all concerned must be done. Such a plan must be validated not only among experts but among those who will implement them as well.

In this strategy of identifying, and seeking practical solutions to real problems, the workshop advocated the need to mount multi-disciplinary research to determine the nature, extent and aetiology of conflicts and resistance to changes among teachers, supervisors, and the educational personnel, including administrators, students and parents.

3. Establishment of an infrastructure to take care of planning, developments, coordination linkage, and dissemination of research in content and methods:

In many instances, it has been found that research for implementation of reforms envisaged in content and methods suffers because the different groups involved in implementation have different view points regarding the strategies and processes of implementation. Research appropriately conceived and conducted can supply reliable and valid information on many aspects of the products, processes and target groups in the implementation of programmes undertaken by a country. It is therefore necessary to develop an appropriate infrastructure of organization and management of research which will involve the various groups concerned with implementation and develop mechanism of participation in research for implementation at various levels. This will have the added advantage of making research relevant as well as increasing the credibility of educational research.

B. Participatory Strategies

Strategies in this category were proposed in order to tackle the problems and issues which are likely to be met during the implementation stage. They range from personnel to technical problems and the strategies suggested are mainly participatory in nature. These strategies are expected to provide directions to implementors and administrators as well as facillitating development of research on the implementation and evaluation of content and methods. Specific strategies in this category proposed by participants are the following:

1. Participation of national, state, and regional teachers' associations, unions, study groups, research groups voluntary organizations, universities, research institutions in the macro level committees:

Prior to and during the implementation stage, it will be necessary for various groups to participate in the planning, development, and evaluation of studies. In order that work may be done speedily, it will be necessary to co-ordinate the participation of various groups, consequently appropriate communication across groups should be provided for, so that research plans, projects and decisions do not lead to an impasse which might be created by conflicting interest groups. It should be possible to resolve differences of opinion and points of view, if participatory meetings are planned in advance, adequate preparation is made as well as follow-up action is taken quickly.

Besides participatory research at the macro level, it is desirable to involve individual schools, parental groups and local education agencies at the micro level of implementation and evaluation. For this purpose, the school should act as the coordinating agency to facilitate current and further research. Some participants, however, felt that unless careful planning and job analysis are carried out, there is

a danger of overloading teachers with work.

2. Mechanism for materials development and production:

It is hoped that every country will be encouraged to establish an item bank for achievement tests, develop evaluation instruments in the affective domain, explore the use of unobtrusive techniques in evaluation, develop software for use with computers and investigate other innovative methods in conducting research. Through these means it is hoped to solve the lack of materials needed in research.

3. Feasibility study of research information retrieval system:

This strategy was proposed as a preparatory step in the creation of a carefully designed computer based research information system for Asia and the Pacific. As an initial step, a study team comprising representatives from selected member countries will undertake a feasibility study on the potential place of an Educational Research Information Clearing House for Asia and the Pacific. The report will be submitted to the Unesco and it is hoped that it will be useful in making a decision on the proposed research information system for the region.

C. Anticipatory Strategies

Many educational problems while not existing now will emerge in the future. Some of the problems encountered today were not anticipated in previous years. It is important that problems of the future be anticipated and possible solutions canvassed. Better still, actions should be taken now to avert future difficulties. Specific anticipatory strategies to achieve these ends are as follows:

1. Expansion of coverage of educational research areas:

It is a common knowledge that social and educational change is a reality. Understanding of this reality will be vital to the development of research on the implementation and evaluation of content and methods. This is coupled with evidence of a widening political and economic context. These expanding horizons have great implications to the development of research. Through this strategy, it is hoped that the member countries will not be caught unprepared for things to come in the educational scene. So, research should be expanded to incorporate the demands of thse changes.

In this regard, educational researchers and administrators need to adopt a broader vision of research. The widespread disillusionment with schooling in recent years have brought about doubts on the outcomes of educational systems and while they have different sources and vary in intensity across countries and regions, the following conspicuous elements appear common:

a) There is a prevailing perception that education has aggravated some key social problems it was supposed to ameliorate such as social inequality.

b) There are policies of educational expansion which generate pressures on the labour market and/or advanced levels of education that cannot be coped with.

c) There is a feeling that educational reforms have in many instances amounted to "more of the same" or to relatively insignificant modifications of the existing systems and thus reduced hopes in the feasibility of genuine reforms.

d) There is a widespread perception that educational reforms tend to be the product of an educational establishment, or a powerful lobby representing large urban, middle-class interests and values, or foreign advisors that do little to remedy the situation.

2. Developing teacher training — a step ahead of the reforms:

During the course of discussion in the workshop, it was pointed out by many participants that any programme of implementation of reforms in content and methods supported by research often meets with resistance from teachers, who continue to teach in the way they were used to teaching, both in terms of content as well as of methods. It was emphasized that more often than not changes in teacher education are introduced much later than the changes in content and methods and that this lag is largely responsible for the lessening of impact of the reforms and, in some cases, even their failure. It is therefore important to develop both pre-service and in-service teacher education programmes appropriate to the changes in the content and methods envisaged. As a matter of fact, reform in teacher education should precede the reform in content and methods. This requires a total plan of implementation of reforms, visualizing the changes required in the entire system, in which, of course, the teachers occupy a key position. No strategy of research and implementation can possibly by-pass them.

3. Utilization and dissemination of research knowledge/results:

Participants felt that many research results are just gathering dust in libraries. Hence, a strategy is to set up a mechanism, through which the results of research will be translated into non technical language, attractively packaged, and disseminated to policy-makers, teachers and other clients who may benefit from the findings. This strategy should be monitored to see the extent of dissemination and utilization.

4. Provision of anticipatory mechanism:

It was pointed out by some participants that it will be desirable to develop in a country a mechanism outside or peripheral to the central research organization/ institution concerned with implementation of reforms, to undertake futurlogical studies, which will indicate the kind of scenario that might develop in a country, in the not too distant future. If an "advanced guard" mechanism is set up within the government agencies accountable for implementation of reforms, it is not likely to succeed in developing suitable research for future scenario. Hence, participants believed it may be a better strategy to develop a research group outside or peripheral to the governmental system. Such a group would not be under time pressure produce results.

In a nutshell, all the foregoing strategies are expected to help not only the implementors but the decision-makers, facilitate the development of research into implementation and evaluation of content and methods. These strategies have been framed recognizing that the research process is a contiuning one and that unless the future is explored as well as the present, obsolescence will set in as fast as reform is implemented. It is within this context that these strategies have been proposed, classified and presented.

D. Strategies for the Evaluation of Content and Methods

Implementation and evaluation of content and methods were taken together in the discussion groups. However, for purposes of emphasis, strategies for evaluation are now presented separately.

Agreements on evaluation have included the following:

i) Evaluation is a continuing process.
ii) Several techniques and styles of evaluation should be resorted to in the evaluation of reform.
iii) Both traditional and non-traditional ways of evaluation should be used by evaluators.
iv) Evaluation is everybody's concern.

In the light of these agreements, the following strategies were proposed:

1. A built-in evaluation mechanism should be included in the plan for reform:

In this context, it is felt that the details of the evaluation as regards nature, type, freguency and indicators/indices should be provided in the plan as well as outcomes being visualized by the developers.

2. Involvement of implementors in the evaluation:

Participants observed that implementors at all levels often feel evaluation as

a threat due to the fact that they have never been involved in the process. In view of this, it was felt necessary to involve implementors at all levels in the entire process of evaluation.

3. *Provision of baseline data for evaluation:*

Participants agreed that when the baseline is not identified, process is difficult to measure. So, baseline data which are valid would be useful and desirable.

4. *Development of evaluation instruments for unexplored areas like the affective and psychomotor domains:*

In this connection, participants felt a need to explore the unobtrusive means of evaluation for both qualitative and quantitative aspects. Techniques should be explored and developed which look into the process of implementation, materials and methods, evaluation, level of appropriateness of manpower, learning outcomes including affective and concommitant learning.

5. *Utilization of APEID network for evaluation of projects on a macro level.*

In consonance with recommendations in the past seminars, a group of consultants is being tapped by Unesco who may be commissioned by member states or Associated Centres to undertake particular assessments, programme reviews and project inspections.

Chapter IV

Recommended Actions

The importance of education is recognized by all countries throughout the region as a means of achieving national aspiration and the social well being of individuals. The part played by educational research in the process of designing, evaluating and implementing appropriate programmes to achieve these ends is also acknowledged. Yet as the participants have noted in their deliberations there are many factors which inhibit the full benefits of research being realized in the classroom setting. Consequently, the workshop makes a series of recommendations to enhance the credibility and utilization of research as it relates to reform of content and methods of education. The first series of recommendations relate to the creation and maintenance of an educational infrastructure, while the second group concerns the commissioning of appropriate research. The final set of recommendations attempt to suggest how Unesco itself can serve the region more effectively. The relationships among the various recommendations of this workshop are shown in Figure 2.

The workshop participants observed that, notwithstanding the frequent emphasis on the development of appropriate infrastructure to facilitate educational research activities in many previous regional meetings, the configuration of facilities and institutions, (such as the one suggested at the Unesco Colloquium in Research and Practice in Education in Bucharest in 1980) has not yet been achieved in many countries of the region. While the meeting would recommend Unesco to urge member governments to consider seriously the preparation of forward plans for creating such infrastructure for advancing educational research in their respective countries, there are a number of more specific recommendations which it would like to make for positive action.

A. Training for Infrastructure Development

The participants of the workshop, while discussing the various problems and inssues, which are related to educational research for implementation of reforms in content and methods, underlined the need for a systematic development of programmes of research related to implementation of reforms. They emphasized the need for greater involvement of the policy-makers, planners, administrators,

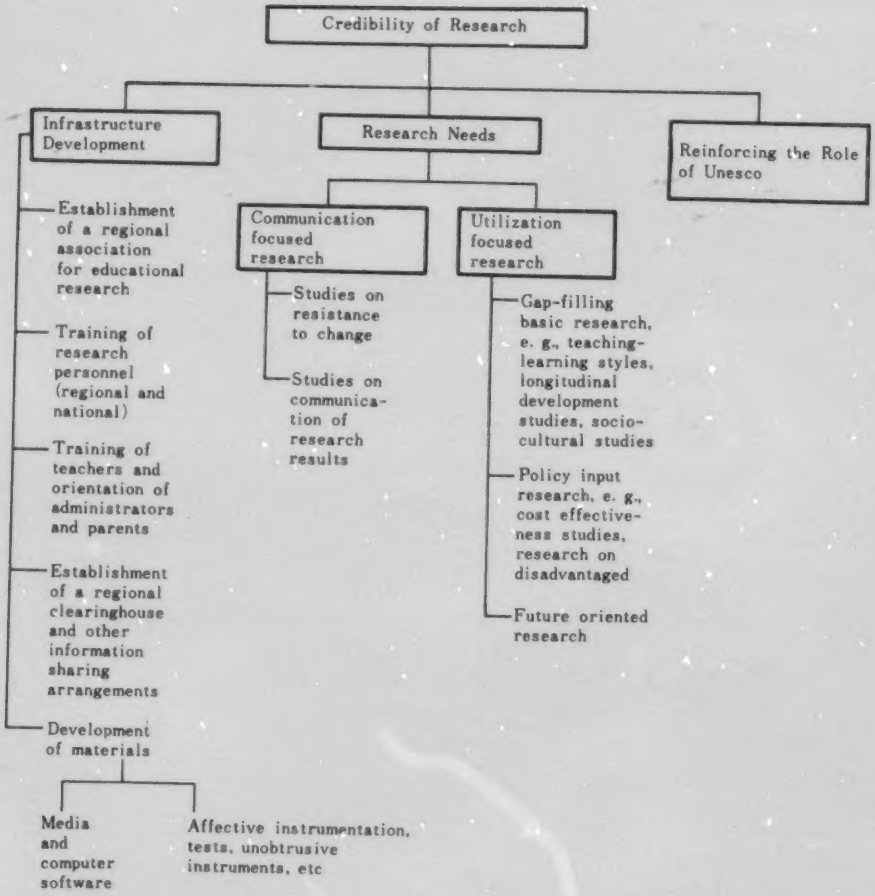
Credibility of Research
Infrastructure Development
Research Needs
Reinforcing the Role of Unesco
Establishment of a regional association for educational research
Training of research personnel (regional and national)
Training of teachers and orientation of administrators and parents
Establishment of a regional clearinghouse and other information sharing arrangements
Development of materials
Media and computer software
Affective instrumentation, tests, unobtrusive instruments, etc
Communication focused research
Studies on resistance to change
Studies on communication of research results
Utilization focused research
Gap-filling basic research, e. g., teaching-learning styles, longitudinal development studies, socio-cultural studies
Policy input research, e. g., cost effectiveness studies, research on disadvantaged
Future oriented research

Figure 2: Structure of Recommendations

teachers and members of the community as well as various groups of researchers in planning programmes of research for implementation. Considering the fact that much research effort is wasted from a lack of planning and co-ordination, the participants expressed the view that there should be a better co-ordinating machinery for research. A serious difficulty encountered in many countries of the region arises out of a lack of properly trained personnel for research who are close to be the field. Also, researchers who have been trained earlier tend to get out of date and require fresh training to meet the emerging needs of research for implementation of reforms. In view of such expressed concerns and felt needs of the participants, it is recommended that:

1) at the national level a co-ordinating machinery should be established in every country which will be engaged in the task of developing educational research for implementation of reforms;
2) national level training centres should be established for the preparation of educational researchers for implementation of reforms in content and methods, where in-service training of researchers should be undertaken for different levels of researchers as a part of a well thought out plan of staff development and career planning; and
3) facilities should be developed, through the good offices of Unesco-APEID, for short-term orientation and training in research for implementation in some of the countries of the region, where necessary expertise is available such as NIER in Japan, the Korean Educational Development Institute (KEDI) in the Republic of Korea, the National Council for Educational Research and Training (NCERT) in India, the Australian Council for Educational Research (ACER), the New Zealand Council for Educational Research (NZCER), and the SEAMEO Regional Centre for Educational Innovation and Technology (INNOTECH) in the Philippines, to name a few.

In line with the recommendations made here, it was noted:

that Programme VIII of *the Work Plan of Unesco-APEID for the Third Programming Cycle, 1982-1986* included Project 5 on infra-structure for research and development,

that the Unesco-NIER Regional Meeting 1972 had already highlighted the need for promoting national research capabilities,

that Unesco sponsored the International Colloquium of 1980 in Bucharest on Research and Practice in Education had also mentioned the importance of national educational research centres,

that similar recommendations were made by two earlier Unesco-NIER reports entitled Educational Research in relation to Educational Reform in Asia and Oceania (1979) and Educational Research and Training in Asia and the Pacific (1981).

In view of the above Unesco meetings which had made similar

recommendations on which actions should be taken, it is further recommended that:

4) the Director of Unesco Regional Office for Education in Asia and the Pacific should personally invite the member states to state their views on the preparation of forward plans for the creation of an infra-structure for advancing educational research in their respective countries,
5) the Asian Centre of Educational Innovation for Development (ACEID) should be invited to prepare a comprehensive and detailed document on the organizational capabilities for research and development of member states, and
6) first, a professional Association for the Advancement of Educational Research in Asia and the Pacific (AAERAP) be developed in continuation of the initial steps towards this direction taken at a Unesco-NIER Regional Meeting of Experts in 1972. Secondly, with a subvention, from the Unesco Regional Office for Education in Bangkok that the proposed Association be invited to advance the implemetation of the prepared Guidelines for the Training of Young Educational Researchers proposed by the Unesco-NIER Regional Seminar on the subject in 1981. Thirdly, that Unesco should invite the Director of one of the Associated Centres of APEID to give consideration to the setting up of an Executive Office for the Association for an initial period of three years.

Teacher Education

Although most of the teachers in many countries have received pre-service and in-service education in the use of innovative teaching methods and new content, case studies have shown that they are not fully certain of how to use such teaching methods as intended by the curriculum writers. This workshop revealed the preference of teachers for use of the talk and chalk method. Other areas of concern are the insufficient stress on creative and imaginative teaching and action-research activities at the micro-level.

There is an urgent need for the systematic planning and development of teacher education reforms in teacher colleges and universities well in advance of implementation of school education reforms. It is necessary to start with the review of the infrastructure needed for teacher education reforms as an integral part of school education reforms because central to the effective implementation of such reforms is the teacher himself. Staff development on a long and short-term basis should include programmes on techniques and designs for utility-focused research in teacher education and school curriculum development and evaluation.

Areas of research recommended are as follows:

i) Effective teaching behaviours,
ii) Micro-teaching,
iii) Innovative teaching methods in the context of social and cultural

background, and

iv) Development of content and methods to suit learner's characteristics.

Information Sharing/Retrieval

The workshop participants recognized the need for: (a) continuing effort in the development of quality research in the region to serve as inputs to systematic policy changes, and (b) information sharing and dissemination of results of research conducted in the region.

In pursuit of these needs, a reorientation of teachers, administrators, policy makers, researchers and all those involved in the implementation of educational reforms to the new knowledge gained from research is necessary. In this regard, member countries should utilize existing mechanisms and educational institutions in undertaking: (a) a continuing staff development programme for teachers and research staff, and (b) packaging of research results and exchanging them among member countries. It is also recommended that an annual convention type of gathering be organized for the presentation and sharing of selected research papers produced in the region. This initial move may be used as basis for the systematic review of research done in the region and the publication of a research review should be added to tasks already undertaken by ACEID and delegated to an Associated Centres of APEID.

It is also recommended that a study group be created through the APEID network which will be responsible for producing a feasibility report for Unesco member states on the value of an Educational Information Centre for Asia and the Pacific (ERICAP). The report of this group should be made available to all member states during the Third Cycle (1982-1986) of the APEID programme. This report should serve as a background document at the proposed meeting intended to evaluate progress being made through developed training modules and programmes for research personnel.

Materials Development

In order to assist the researcher, particular attention needs to be directed to the development of specific instructional materials and valid test instruments. An example of material to be developed is computer software to accompany microprocessors or minicomputers which are becoming increasingly accessible to countries in the region. The affective area also needs special attention in terms of instruments that should be used for evaluation purposes. There is also a need to utilize the skills of communications specialists in the development of mass media software, which would in turn entail the development of special research skills for evaluating learning materials, and particularly the impact of broadcast, print and other media, including multi-media packages used in distance learning.

It is therefore recommended to Unesco-APEID that

1) A survey be undertaken of available computer software to determine the most useful and compatible data analysis package that needs to be assembled or developed for distribution among member countries;
2) A regional workshop be conducted with the specific purpose of developing valid test instruments, especially in the affective domain; and
3) (a) A review of existing educational software, e.g. videotapes, audiotapes in science, mathematics and English, be carried out; and
   (b) a regional workshop of educators and communicators be held not only to acquaint them with these materials but also to help them develop the special research skills needed for evaluating these materials.

Already some aspects of this recommendation are included in the APEID programme but the workshop participants wished to stress the significance of considering future developments and to reinforce the value of the work currently being done.

It is also recommended that, after the initial impetus from Unesco-APEID, member countries should seriously follow-up with further development of materials and dissemination within, as well as among, the countries in the region.

B. Research Needs

When discussing the problems and issues related to educational reforms several key research issues emerged. These can be classified into two main groups; namely research focusing on communication and research centering on utilization.

Within the first category two major projects are recommended:

1) Research into those factors inhibiting the adoption of educational reforms by teachers, administrators and the general educational community.
2) Investigations into the best methods of communicating the results of research to the various interest groups. Special attention should be given to the use of the electronic media.

It is recommended that each member country, with the technical assistance where necessary of Unesco-APEID, conduct the research and share their findings with member nations through ERICAP.

In the second category, eight projects were identified. They encompass policy input; basic research related to curriculum design, content and methods; and future directions. The proposed investigations were as follows. Research into:

1) the cost-effectiveness of particular teaching methods or learning strategies in terms of teaching time, time on task and resource requirements.
2) all forms of disadvantage including rural and urban students, ethnic groups, girls and refugees.
3) the identification of future educational problems and the techniques

whereby they can be investigated.

4) the skills, content, and attitudes required by teachers to implement educational reform and their relationship to programmes provided through pre-service and in-service activities.
5) the nature and extent of differences in skills, knowledge, attitudes and values among the different groups in any one country. Groups studied should include those living in urban and rural settings, and drawn from different socio-economic, cultural and linguistic backgrounds.
6) the different learning strategies adopted by students with different contextual backgrounds.
7) longitudinal studies which trace the intellectual, physical, and social growth of children as they proceed through the various stages and levels of schooling.
8) the professional development provisions for educational researchers and the identification of their specific needs.

It is recommended that each member country, with the technical assistance where necessary of Unesco-APEID, conduct research in these areas and share their findings with member nations through ERICAP.

C. Reinforcing the Role of Unesco

In its deliberations, the workshop took note of a series of activities which have been organized jointly by Unesco-APEID/NIER during the last decade concerning educational research and reform in the Asian and Pacific Region.

After reviewing the findings and recommendations of those meetings and workshops held in the past, the participants of this workshop observed that many of the recommendations contained in those reports have not been implemented and similar recommendations have been made time and again. Participants of this workshop believe Unesco/APEID has a very important role to play in facilitating the implementation of such recommendations. Thus, in recognizing this, the workshop recommends that:

1) Unesco undertake a thorough review of all recommendations made concerning educational research in Asia and the Pacific (during the last ten years) and prepare a technical paper to delineate areas of importance and priority for immediate action;
2) Unesco take the necessary action and prepare appropriate plans to encourage and support member countries in considering effective implementation of the recommendations of this workshop; and
3) Unesco initiate regional activities to assist and support the member countries in realizing the action plans and recommendations of this workshop.

Appendix I

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Appendix II

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SELECTED EDUCATIONAL RESEARCH STUDIES IN AUSTRALIA

Graham J. Whitehead
Australia

Numerous investigations into reforms of content and methods in the classroom are being undertaken in Australia. This paper makes no attempt to review the multiplicity of studies that are currently on-going. Rather it selects a few which reflect different assumptions about the nature of research and the strategies or methodologies that need to be used. Each study is notable for different reasons and can be used to illustrate issues of interest and concern to researchers. The presentation of the studies has been loosely sequenced along a continuum of research styles. At one end of the continuum emphasis is placed upon quantitative or normative type data while on the other, attention is focused upon field type studies where participants are the actual researchers investigating issues of major concern to themselves. Many Australian research studies emanante from curriculum and research branches in the six States, the two mainland Territories and the Commonwealth Ministry of Education. Many are commissioned by statutory bodies such as the Commonwealth Schools Commission, the Curriculum Development Centre, and the Education Research and Development Committee*. Other research studies are undertaken by staff members of Universities and Colleges of Advanced Education or by students studying for post-graduate degrees. The Australian Council for Educational Research, an independent national research body, continues to maintain a strong research programme which includes investigations into the social context of education, teaching and learning, and educational measurement and evaluation.

The Australian Council for Educational Research (ACER) is involved in several major studies which adopt a traditional approach to research. One, an international study, aims to measure the current state of science education across the world, to investigate curricula and other factors which explain differences in the outcomes of science programmes, and to make comparisons with the results of a study conducted in 1970. Known as the Second IEA Science Study it has been assisted by a financial grant from the National Institute for Educational Research, Japan. There will be several agreed international core components to the testing programme and data analysis. At present, about thirty countries are involved in the planning stage. In Australia, an analysis of science curricula is being undertaken by means of a survey of a small number of schools in each State. In addition, a detailed examination and analysis of changes between 1970 and 1980 in the Year 12 science

* Support by the Commonwealth Government for the latter two organizations was withdrawn in 1981. Both are now defunct.

curricula is planned. The other related part of the planning has involved the development of a range of trial tests. These are being administered to groups of students in the participating countries in order to provide data to assist the preparation of the international core tests.

A second ACER study is the Classroom Environment Study: Teaching for Learning. This is a three-phase experimental project consisting of teacher survey, classroom observation, and teacher education components. The project is currently in its second phase which is focused on consideration of the relationships between specific teaching practices and student outcomes, both cognitive and affective.

Following development and trials of the instruments during the latter part of 1981, the classroom observations were undertaken early this year. The Principal and Year 5 teachers in each of the eighty metropolitan primary schools that took part in the teacher survey phase of the study were asked to permit an observer to record the teachers' instructional and managerial practices during mathematics lessons. Seventy five teachers spread over thirty nine schools volunteered to take part in the study.

Each classroom was observed for a minimum of 30 minutes on at least eight occasions spread across eight to ten weeks. The class grouping arrangements being used, the participants in each student/teacher interaction, and the nature of the interaction were recorded using a low inference method. This aspect of the observation was teacher focused. In each classroom, eight students were also observed to provide a student focus to the observation. The nature of the activity on which each student was intended to be working, whether the student was on task, and whether the students were interacting with the teacher were recorded for each of the eight students in five occasions during each lesson. Teacher and student questionnaires were also administered together with pre- and post- tests of mathematics achievement.

Another study carried out by ACER is the Australian Studies in Student Performance (ASSP) project commissioned by the Australian Education Council, a Council of State and Commonwealth Ministers of Education. This study has caused considerable controversy. It followed a national study undertaken in 1973 which explored the numeracy and literacy standards of a sample of ten and fourteen year old students throughout Australia. The new study had similar objectives, namely to develop and to administer criterion referenced tests in reading, writing and numeration. Four hundred and seventy six schools took part with 5,473 ten year olds and 5,103 fourteen year olds. These figures represented 78% and 73% respectively of the designed samples. The report of the study detailed national performance on individual items and sub-tests and by sex and school locations. School or State comparisons were not made. Currently, the Australian Education Council is considering whether the testing programme should be continued. Part of this consideration involves examination of an evaluation report prepared by Power and others.

The Power Report, entitled National Assessment in Australia: The Evaluation of the Australian Studies in Performance Project was commissioned by the Education Research and Development Committee. Its intent was to provide independent evaluative comment on the ASSP project. Concern had been expressed about the possible backwash effects of the ASSP testing on the curriculum of schools. Consequently, Power and his team were asked to seek answers to questions such as:

What views are held within the community regarding the purpose and desirability of the programme?

What are the strengths and limitations of the procedures used to assess standards of literacy and numeracy?

What problems, if any, were encountered in implementing the programme?

What impact did the testing programme have, in the short term, on teaching methods, curriculum, students, teachers and parents in participating schools?

In what ways were the findings interpreted and used by schools, education systems, policy makers and the media?

How did students, parents, interest groups and the media react to the results?

What are the likely long term effects of ASSP on students, schools and society?

Another cooperative venture is ACAP: the Australian Cooperative Assessment Program (ACAP). Supported through the Australian Education Council by the various State education departments and educational authorities in the Territories, this project seeks to provide ways whereby educational officers can work together to produce materials which assist teachers to evaluate the progress and the development of their students. So far, the extent of the cooperation has been slight but Western Australia and New South Wales have produced materials in mathematics, the Australian Capital Territories materials in reading and Victoria has been working in oral and written language, and social learning.

The written language aspect of the ACAP project has involved the development of a theoretical framework which incorporates important factors contributing to the determination of student attitudes to writing. This framework has been used to develop an 80-item Likert scale, which was field tested with samples of Year 7 classes. Item and factor analysis were used to refine the scale to a suitable length. An additional aspect of this investigation explores possibilities in the teaching of writing stories in Year 7 classrooms. The first part of the study is now underway and is focusing upon students' perceptions of the value in their own stories. The second part is to focus on techniques, strategies and materials for the improvement of the craft aspects of writing.

Several State education departments are undertaking research into the teaching of handwriting. Fundamental changes in writing style were introduced into many Australian schools in the 50's and 60's. Print script replaced a cursive hand, whereby the letters are joined, in the curriculum of junior classes. It was

introduced because of its apparent simplicity and the supposed ease with which it could be mastered by young children. Modified versions of the cursive hand were then introduced into the more senior classes of primary schools. These cursive scripts were designed to utilise the skills developed in earlier classes. Since the early 70's, there has been concern expressed by educators and members of the community about the inadequacies of the cursive script handwriting. For example, they suggested cursive script degenerates towards ineligibility under speed, is unsuitable for children using ball point pens, is not aesthetically appealing and is not amenable to the development of a personal style.

The various state project teams drawing upon the experience of overseas research have developed simple modern cursive styles which are both suitable for modern implements and which retain legibility at speed. Several research teams are now investigating matters such as teaching techniques and learning strategies, the grip of writing implements problems for left handers, embellishment of lettering, fluency under speed and spacing and scope.

Talk in the Primary Classroom, a project of the Victorian Education Department, is directing its attention to two basic questions."Do teachers dominate the verbal dialogue of the classroom?" "Would such a practice be to the detriment of pupil's education?" To answer these questions classroom dialogue has been recorded by an observer who notes the exchanges between teachers and their pupils during normal classroom periods. The recorded dialogue has been analyzed in terms of three characteristics. First, the extent to which teachers initiate verbal exchanges with their pupils; that is where there are new thoughts not connected to preceding utterances, nor parts of a verbal chain. Secondly, the number of words spoken by teachers and pupils. Thirdly, the extent to which the teachers control the context of the dialogue: Did they select the theme? Did they set the direction and suppress stray conversation? Data has been collected from eighteen Victorian primary schools and has involved the co-operation of 43 teachers.

Recently, two studies have been undertaken in Victoria to assess the impact of new sets of curriculum publications. One concerned three primary science guides, the other is a manual designed to assist schools plan and develop a more appropriate curricula for their students. Neither study was notable for the sophistication of its design nor the statistical procedures employed, but both sought to gather the views of teachers in a systematic way.

The science survey, Primary Science: A Formative Evaluation, was an evaluation of materials in an early stage of development. Teachers were asked to comment upon quality, fit and utility of the documents for their situation. All volunteers, teachers were asked to identify a topic area within the guides, plan how they would use it and then teach it over a six week period. During this time, a researcher visited classrooms and kept anecdotal records of the activities observed. At the end of this period, the participants were interviewed and a questionnaire was completed. This information then formed the basis for the revision of the

documents prior to final publication.

The investigation of The Primary School Curriculum: A Manual for Victorian Schools explored the acceptability of the document as published and the strategies used to disseminate it to schools. Five separate questionnaires were used to sample the views of inspectors, consultants, principals, teachers and members of School Councils.

Follow-up interviews were conducted in 30 of the 141 schools who responded to the questionnaire. The intention is that the results of the study will influence the design of future publications and the strategies used in their dissemination.

More in keeping with the action model of research is the Choice and Diversity project. It is funded by the Commonwealth Schools Commission. Originally only two State Education Departments were involved but recently others have joined.

The major aim of the Choice and Diversity project is to explore choice as a possible means of improving schooling. Choice is seen to range from the situation where students select from a set of subjects or courses offered by the school to the situation where individual students and other involved people negotiate with the school to arrange the most appropriate form of schooling. A negotiated curriculum is seen as the stronger form of choice in comparison with the selected curriculum.

In Victoria, the project is managed by a committee representative of parents, teachers, principals and administrators supported by an executive officer. The project has used several methods of investigating the phenomenon of choice. It has worked with schools in a case study approach, collaborated with educational regions, policy groups and professional associations, has engaged in a literature review and extensive discussions about the conceptions of choice, accountability, zoning of pupils to particular schools, and other associated matters.

Schools involved have directed their attention to a variety of matters including assisting and responding to the opinions of parents in a predominantly multicultural community, facilitating parental involvement in school decision-making, joining with other local schools to provide alternative courses, developing alternative school organizational patterns within the school, exploring the concept of senior high schools, and extending social and curriculum experiences of children in small, isolated rural schools.

To assist the activities of individual schools or school clusters, money and advice have been provided for surveys, for data processing, for publications, and for transport. Now, schools are being asked to submit their reports to the managing committee so that the State report can be prepared for submission to the funding body. This report is expected to highlight the activities of the schools, the processes they used to facilitate the concept of choice and the impact their school has had upon the quality and range of student experiences. To this information, the Committee will add its own assessment and contribution to the debate.

The Studies in Student Improvement project has a charter of working closely with schools in the development, implementation and evaluation of teaching

strategies. The strategies to be explored were not originally specified in the project plan but were expected to evolve in response to the needs defined by the participants in the context of their schools. The project saw the development of curriculum and the development of teachers as inseparable factors.

Three schools have been involved, two at primary and one at the secondary level. From early discussions with the staff in the secondary school, it was decided to focus attention on mathematics at the Year 7 level. At this level, teachers felt there was a lack of understanding evident in the students work, that the Year 12 orientation of the content selected was out of keeping with the needs of many students, and there was a dilemma whether understanding or Year 12 demands should take precedence. The effectiveness of the school's remediation programme was also questioned. Consequently, the teachers set out to develop appropriate curricula for their students at that level.

The researcher has documented the concerns of the teachers and posed a series of questions for discussion. What should be taught? How should it be taught, and why? Assistance has been given by the researcher in organizational matters, and advice has been provided on data collection and interpretation. The researcher has become a critical friend to the teachers participating in the project; a sounding board for their ideas rather than an initiator of actions. At the same time, however, she has recorded her observations so that team members and others may reflect upon and learn from the experiences of the project.

Another team has adopted an action research approach to investigate issues and patterns in teacher curriculum decision-making. The original proposal for the study entitled Social Organisationn of Learning in the Classroom, was extremely broad. This was deliberate, so as to allow the project to develop in response to a variety of teacher needs.

A number of potential stances were rejected. The project could have explored the wider sociological implications of classroom organisation, or a descriptive analysis of classroom interaction, or even the physical arrangements of classrooms. However, to have followed any of these directions would have involved the project in describing what already happens, either in theoretical or practical terms, without necessarily providing outcomes in terms of teacher action. Eventually, the project set out to explore the ways teachers articulate and build upon their own learning, both theoretical and practical, about children, classroom and content.

* * *

Underlying each of the Australian studies briefly described above are assumptions about the nature of research, the participants in the research process and the expected outomes of the activity. Each brings with it its own set of problems which should be acknowledged by the researchers and, hopefully, solved. Irrespective of this, each study is making a contribution to the documentation and shaping of change and the improvement of school practices.

A REVIEW OF AN ON-GOING PILOT STUDY FOR MICROPLANNING PRIMARY EDUCATION

Md. Azhar Ali
Bangladesh

A. Introduction

The Government of the People's Republic of Bangladesh is committed to introducing universal primary education in the country according to the provisions of its Constitution. Following this constitutional obligation, the previous Governments as well as the present one took different decisions in setting up appropriate strategies for the universalization of primary education (classes I to V). The current Five-Year Plan (1980-85) for the development of Bangladesh incorporates strategies and action programmes aimed at having 90 percent of primary age group children in schools by 1985. The objectives of the Five-Year Plan (1980-85), in respect of primary education, put much emphasis on universalization of education, on the development of cognitive skills, and on reducing the gaps between the affluent and the deprived sections of the population. It is assumed that the emphasis on universal primary education, supplemented by a mass literacy programme will raise the literacy levels gradually. And it is also assumed that primary education contributes much more to social benefits than other levels of education.

The current statistics on enrolment in the primary level indicate that no more than 75 percent of the primary school age population are attending school. Achieving the target of universal primary education will require a gigantic undertaking in terms of constructing primary schools, recruiting and preparing an additional number of primary school teachers, supplying and producing teaching materials, providing funds for salaries and other costs, and providing appropriate incentives to the children of the poorer homes in order to attract them to primary schools. Adequate budgetary provisions will have to be made.

It seems that decentralization of management of the affairs of primary education will expedite the process of universalization of primary education in Bangladesh. It also seems that the efficiency of the primary education system will increase rapidly and its relevance for social development will improve if the process of planning can be reversed. At present, primary education for the entire country is almost wholly administered under a very strongly centralized system. The Second Five-Year Plan document proposes that the system should be decentralized as much as possible. The present Government has already announced a policy of decentralization of administration and management of primary education. The Government has set up local education authorities consisting of representatives of

local communities as well as goverrment officials to run the affairs of primary schools in each primary school district (currently known as sub-division). It is felt that these steps toward decentralization will lead to greater democratization of education and greater participation of communities in the affairs of their own education, bringing about ultimately a primary system of education much more relevant, efficient and improved in respect of contents and methods. The national plan will, therefore, be the result of an amalgamation of micro-plans from thousands of village communities throughout Bangladesh.

In 1980 the Bangladesh National Commission for UNESCO (BNCU), Ministry of Education formed a research team to conduct a Pilot Study for Micro-planning Primary Education in Bangladesh. The study was sponsored by the International Institute of Educational Planning (IIEP, Paris). The report of the study is expected to be published soon.

B. Objectives of the study

To explore the possibilities for micro-planning primary education for the whole country, a pilot study was conducted. The specific objectives of the study were as follows:

a) To make a thorough diagnosis of the actual coverage and functioning of the school system.
b) To analyze the socio-economic conditions of the communities in the area as well as their educational potential.
c) To estimate the school age population at the level of each village for the year 1985.
d) To propose a reorganization of the school network allowing universal access to school, suggest some measures encouraging pupils' participation and favouring community involvement in the management of the schools.
e) To see if it is possible to involve communities in the discussion and implementation of the proposal.
f) To develop a simple methodology which can be taught to the local education officers for applying in their own areas.

C. Scope of the Study

The area selected for the pilot study consisted of the five unions of Manikganj Thana of Dhaka district and five unions of Natore Thana of Rajshahi district. The particulars of the unions are given below:

District	Thana	Union	Area in Acres	Population
Dhaka	Manikganj	Garpara	3,955	12,177
〃	〃	Dighi	3,289	8,563
〃	〃	Nabagram	4,861	12,319
〃	〃	Zagir	5,162	12,104
〃	〃	Krishnapur	7,566	14,615
Rajshahi	Natore	Kafuria	7,516	9,251
〃	〃	Baraharishpur	10,338	12,618
〃	〃	Baghapotia	7,884	10,761
〃	〃	Lakshmipur	12,102	17,087
〃	〃	Tebaria	4,074	11,617

D. Methodology

The study had four phases, namely:

(a) Collection of data;

(b) Diagnosis of the existing educational system and community potential;

(c) Projection of enrolment; and

(d) Elaboration of proposals for the organization of education in the area.

Collection of data. To collect data from the pilot area three separate questionnaires were framed and administered to the respondents. The first questionnaire was used to collect information concerning enrolment, attendance of pupils, repeaters, teachers' qualification and attendance, physical facilities, land available, cost and financing of schools, origin and distance covered by pupils. The second questionnaire was used to collect information on the state of relative wealth, socio-economic conditions, and educational potential of all villages in the area. The Union Management Council, the village government, the school teacher and some community members supplied the information to the surveyer who filled in the questionnaire on their behalf. The third and final questionnaire was administered to the family heads in the villages to obtain information on their attitudes towards education.

In addition to the three questionnaires, an instrument was administered to the Thana education officers, superintendents of primary training institutes, headmasters of schools in the selected area to gather opinions on the educational problems evident in the area and to find out their willingness of the members of the communities in the area to help in the solution of the problems. The collected data were then carefully analyzed.

Analysis of data. The collected information was tabulated for the selected unions. Efforts were made to analyze the collected information in such a manner that a picture of the present system of primary education in the selected area, with all its strengths and weaknesses, could be visualized.

Findings and interpretation. Data were analyzed and the following findings were revealed:

1. The wastage of promising manpower was very high as the difference between the enrolment and the final products seemed to be significantly high. It was statistically found that out of every seven children who started educational career as beginners only one child reached the final goals of primary education.
2. The promotion policy of the schools of the selected area was found defective. In primary schools all students should be promoted to the next higher class and no child should repeat his class. But the collected information showed that some children of grades I to V repeated their respective classes without being promoted to the next higher classes.
3. No uniformity in age was found among the children of different classes. Statistical information indicated that the most outstanding cause that deterred the uniformity in age among the children of same classes was that the children could not start schooling at the same age. The policy of promotion also contributed to this problem.
4. In the schools under the selected area, majority of the teachers were males. However, in terms of educational qualification of the teachers, no male teacher had non-Matriculation as his basic educational qualification. Only among the female teachers were a small number found to be untrained. All male teachers were professionally educated.
5. The schools in the selected area were found to suffer from an acute shortage of land area.
6. In most of the schools the teaching staff did not seem to consider the number of students. As a consequence, the ratio between the teacher and the pupils was extremely high. This served as a deterrent to an effective teaching-learning situation.
7. A good number of education officers, Thana administration officers, heads of secondaly schools, advisers to the primary training institutes, college teachers, heads and assistant teachers of primary schools and other local patrons of education extended their opinions supporting their direct involvement in the local primary education.
8. The level of difficulty of the reading materials in grades I and II was found to be a basic weakness of the present primary curriculum. The absence of a separate board for conducting certificate examinations was identified as an additional drawback of the primary curriculum.
9. The vast majority of the respondents of the pilot area identified the teaching aids available to primary school teachers as inadequate.
10. Almost all the respondents of the two pilot Thanas opined that the local people should take initiative in sending the children of school-going-age to schools, in convincing those who are unwilling to come to the school to

become interested in school education, and in rendering physical and intellectual services for the proper development of the schools as well as the spread and development of primary education as a whole.

11. All the respondents stated with emphasis that illiteracy, poverty, village politics, and lack of active co-operation of the people were the major obstacles in developing primary education.
12. The collected opinions of the respondents gave clear indications for making primary education compulsory, and for making primary education universal in Bangladesh.

E. Conclusions and Recommendations

On the basis of the findings, it seems that in order to make Bangladesh free from the curse of illiteracy, there is a need to reorganize primary education. However, this may be a gigantic undertaking because seventy percent of the people are still illiterate. Hence, while the pilot study for Micro-planning Primary Education in Bangladesh attempted to identify the needs and demands of particular localities before the introduction of universal primary education gradually all over Bangladesh, the results of the investigation gave clear indications of the problems, strengths and weaknesses which need adequate consideration before universal primary education is introduced. Using the findings as basis, the recommendations were presented:

1. More local people should be placed to see the effectiveness of the administration of primary education. This will also increase community involvement in administration decision making.
2. More professionally educated female teachers should be placed in primary schools, as psychologically they are more prepared to teach young learners.
3. Children should be helped to learn to the maximum according to their capabilities. Nothing unusual should be imposed on children to make them unhappy in the classroom environment so that they drop education early and lapse into illiteracy for the whole life.
4. Active attention should be given to bring all children to schools at the same age so that uniformity of age maintained throughout the years in all classes. This is expected to reduce the drop-out rates because of age variation among children of the same class.
5. Land area for each of the schools should be adequate so that after the construction of the school building, space is left for organizing outdoor recreation for children. This will attract children to schools as they will consider their schools as beautiful substitutes of their homes.
6. Each of the schools should be provided with adequate number of teachers so that the ratio between the teacher and the students is improved.

7. Attention should be given to make the curriculum suitable for the primary school children. Unnecessary burden should be reduced so that undue fear of the burdensome contents may be avoided.
8. To make teaching-learning effective, teaching aids should be made adequate and suitable.
9. All possible measures should be adopted to make primary education compulsory to pave the way for its introduction as a universal measure to wipe out illiteracy in Bangladesh. Children coming from the deprived sections of the population should receive opportunity cost from the public funds of the community as far as practicable.

Finally, the vital necessity for micro-planning primary education in Bangladesh has been felt by the research team and the various aspects that may create deterrents in makimg it a success have been idenfitied. It is hoped that the Government of the People's Republic of Bangladesh will vary carefully look into the results of the study to judge the possibilities of micro-planning primary education in the different regions of Bangladesh so that universal compulsory primary education may be facilitated.

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AN EXPERIMENTAL REFORM OF CHINESE CHARACTER TEACHING

Zhang Tianruo and Li Bo
China

Preamble

China has seen many experiments and reforms of educational content and methods in her primary and secondary schools, which have gained memorable achievements. Here is a introduction to an experimental reform of Chinese character teaching in China's primary schools——the Concentrated Approach.

True, Chinese is one of the most advanced and richest languages in the world. Yet, different from English, French, Russian and some other languages, Chinese presents a written system of pictographic characters, which, as is well-known, are difficult to read and write, the pronunciation having no inexorable attachments to the construction, the structures of strokes being multiple and varied. That fact sets special obstacles in the way of Chinese language education. And without the solution of character acquistion, reading and writing would be out of the question, and the learning of other subjects would be seriously affected. Thus, the research for a more effective teaching method for character acquisition has been a haunting issue in Chinese language education in our primary schools. At present, there are three ways available: 1. The Concentrated Approach, 2. The Decentralized Method, and 3. The Eclectic Way.

A Historical Review

The Concentrated Approach enable the pupils to acquire knowledge of chararacters through the reading of texts. It means gathering chunks of characters in batches for acquisition first, and then, reading is next, That is, the acquisition of a group of characters is followed by the reading of a group of texts to strengthen it; and the acquisition of another group of characters is followed by the reading of another group of texts for consolidation, and so on.

"Character acquisition first, reading second" is one of the traditional experiences in Chinese language education, which has a history of over a thousand years. For the convenient acquisition of characters by children, there appeared, in ancient China, various kinds of rhythmic primers composed of masses of functional characters. The most well-known of these are the following:

1. *The Thousand Character Classics* It came in 540 during the Southern Dynasties. It has four characters to a sentence, heterogenous in content ranging from elementary knowledge of natural science to plain historical

facts;

2. *The Surname Book* It came in 960 during the Northern Song Dynasty. It has four characters in a meaningless sentence, composed of Chinese surname; and
3. *The Three Character Classics* This came in about 1200 in the Southern Song Dynasty. It has three characters in a sentence. It is mainly of plain historical facts and ancient legends and fairy tales.

Before the learning course was switched to the reading of ancient poems and other classics, the children were taught *the Character Classics*, to gain 520 characters; then *the Surname Book*, to command 322 more characters; and then *the Thousand Character Classics*, to grasp 602 more characters. After the learning of the three, the number of characters acquired amounted to about 1500. The above three pamphlets may be regarded as primers for concentrated character acquisition, and they lasted in their use until the end of the Qing Dynasty in about 1910.

From the modern point of view, however, the use of these primers, all written in classical Chinese and most of the content outworn, is limited. And the children's intiative was hard to bring into full play as the only goal of teaching was the acquisition of characters, with the explanation of meanings disregarded and without the rules of character formation applied in it.

In 1922 however, the new school system in China was implemented and brought great changes in the character-acquisition primers. The vernacular took the place of classical Chinese; and the tradition of "character acquisition first, reading second" was replaced by the combination of character acquisition with text reading (character acquisition through text reading), with which, few characters were taught in a lesson. In this way, the speed of character acquisition was rather slow, and the number of characters acquired in a particular period was comparatively small.

The Establishment of the Concentrated Approach

In 1958, the Concentrated Approach was brought into being by investigation and research of the traditional experiences of character teaching and of the speeded-up character acquisition developed for wiping out illiteracy among adults in the early days of New China. It gained admiration and support from authorities concerned, and drew active responses from many teachers and schools. With joint efforts and through many years of experiments and practice, the Approach is now on the way to perfection.

At first, the classification by homophone was adopted in teaching, but much was left to be desired, as there are many homophone characters, and confusion resulted from homophonymic conflicts. An investigation showed that the pupils had a better command of near-homophone-homograph characters, e.g. 马 (horse) —— 吗

(mother), 吗(a question character), 码(dock, etc.) and 骂(abuse). All these characters have the same root of 马 denoting the same pronunciation with different tunes, and the other components denoting the meanings: 女, woman; 口, mouth; 石 stone (Docks are built of stones.); and 吗, two mouths. But that did not solve the problem completely either. Eventually, the skill of "basic-character-lead" was tried, which has proved to be capable of introducing more characters, e.g. 干——竿,杆,赶,秆,汗,岸. 干 is the basic character, and 竿(bamboo pole, the component 竹meaning bamboo), 杆(the shaft or arm of something, 木meaning wood), 赶(hurry, catch up, 走 meaning run), and 秆(stalk, 禾meaning standing grain) are all near-homophone-homograph characters, while 汗(sweat) and 岸(river bank) are compound characters which have the same part of 干 but are pronounced otherwise, and to which classification by homophone can do little. Thus, the basic-character-lead is employed as the main form for concentrated character-acquisition teaching, complemented with other forms such as pictographic characters: 日(the sun, the primitive writing being ⊙), 月(the moon, the primitive writing being ☽) and 水 (water, the primitive writing being 〰): near-homograph characters: 万(ten thousand),——方(square), 大(large)——太(extremely, etc.), 目(eye)——自(self); associative compound characters: 小(small) and 大(big)——尖(sharp), 日(the sun) and 月(the moon)——明(bright), 一(a stroke meaning put out) and 火(fire)——灭(put out a fire, destroy, etc.), and antonyms, etc. It has shown its effectiveness by enabling the pupils to acquire about two thousand five hundred characters within two years, six hundred in the first term, seven hundred in the second term, and one thousand and two hundred in the second year. This way, reading training (including complementary reading) is moved up, and the education of other subjects is improved too, without the pupils feeling pressed.

In the last few years, the Concentrated Approach has developed with rapid strides, being applied in many pilot classes and schools, though still confronted with some challenges.

The Advantages of the Concentrated Approach

1. The primers for concentrated character-acquisition helps to carry out the principle of "laying emphasis on character-acquisition" in lower grades in primary schools.

Without the stress placed on character-acquisition, there would be too many things to do, and the attention of both the teachers and pupils would be diverted. When an explicit stress is laid on character-acquisition, the quality of instruction is greatly improved, no matter what method is employed. But the primers for concentrated character-acquisition is especially helpful in implementing the principle of laying the emphasis on character-acquisition. They enable the pupils to go all out to learn characters. Thus, both the teachers and pupils are free from interference, and therefore can focus their attention and energy on the learning

process. As an ancient Chinese saying goes, "The best part of instruction lies in the concentration of mind." The adoption of such primers for character teaching helps to attain the "concentration", which brings forth the outcome of high efficiency.

2. The gradual program of "character acquisition first, reading second" conforms better with the law of cognition and thus is more acceptable to children, because the difficult points are separated and diminished.

The Concentrated Approach aims at the cultivation of pupils' ability to read and write, with the acquisition of characters as the foundation. The procedure of "character acquisition first, reading second" divides the teaching into two stages, each having a unitary goal in it. Focusing on character acquisition while learning them; and fostering reading ability while reading,with the acquisition of characters being consolidated at the same time. Hence, both character teaching and reading instruction are easier and more effective.

3. In the primers for concentrated character-acquisition, two or three hundred characters are gathered as a group, so that it becomes easier to classify characters by appearance, pronunciation and meaning. It also brings the rules of character formation into full play, thus enabling the pupils to have a better command of the approach.

True, it is an uphill job to learn Chinese characters, but the characters have their formation rules, the proper use of which helps memorization. And that is what the primers for concentrated character-acquisition has achieved.

4. It helps the pupils to keep the initiative in their own hands and bring it into fuller play. It helps arouse the pupils' interest in learning and enable them to develop intellectually.

In the past, the pupils used to rely on the teacher in learning characters. But now due to the illustration of the formation rules of Chinese characters given by these primers, the pupils can grasp and make use of these rules in learning better and faster. By so doing, they are switched from a passive position to an active one. They can do the previewing by themselves, and to a certatn extent, learn without the help of the teacher.

What is more, while applying these rules for memorizing the pronunciation, appearances and meanings of characters, the pupils have to do some analysing, synthesizing and reasoning, which helps promote the intellectual growth of the pupils.

5. Being relatively simple, the Concentrated Approach can be easily adopted by teachers in ordinary schools, even those in rural ones.

After twenty years spent on probing into all its phases and accumulating experiences, the Concentrated Approach has, by and large, taken shape. Its procedure is plain and easy. Average teachers for the junior classes can grasp it after seeing it demonstrated once and trying it themselves a few times. As a matter of fact, many junior teachers and many people in villages have mastered it and have done very well with its use. As for the pupils, they get used to it after a few class

hours.

6. The Concentrated Approach has considerably changed the face of reading instruction, thus providing good conditions for the earlier instruction of writing and training.

When the acquisition of a good chunk of characters is immediately followed by reading, two purposes can be achieved at the same time: the acquisition of characters is consolidated and reading training is carried out without character obstacles in the way. The pupils can read the texts by themselves and of their own accord. It is a frequent occurence that the pupils have read the texts and even can recite them before being taught by the teachers. Such being the case, higher requirements for reading training can be put forward and the speed quickened. In addition, due to the acquisition of large number of characters, the pupils can do lots of outside reading ahead of time, which in turn helps strengthen the acquisition of characters and phrases, thus paving the way for earlier training in writing.

Many facts have proved that the above mentioned advantages of the Concentrated Approach helped lay a solid foundation for the pupils to learn other subjects as well as Chinese.

DEVELOPMENT OF RESEARCH CONCERNING THE IMPLEMENTATION AND EVALUATION OF REFORMS OF EDUCATIONAL CONTENT AND METHODS

R. C. Das
India

A. Background Information

India has a federal type of Government with 22 states and 9 union territories. Although education is a subject on which both central and state governments can legislate so far in practice, education is mostly controlled by the state governments. Each state government and union territory determines the curriculum and textbooks for the education at the school level from primary upto senior secondary level. University education is controlled by universities which are set up under acts of state legislature or of Parliament.

In each state there is a State Institute of Education (SIE) or State Council of Educational Research and Training (SCERT) set up by the state government to advise the government in implementation and evaluation of reforms in school education. This organization, which has a body of academic officers, prepares from time to time curriculum for the different levels of school education and develops textbooks based thereon which are then published by the state government for use in the schools. It also conducts evaluation and research in content and methods. For effective implementation it organises various training programmes for the teachers and other educational personnel.

At the centre, there is a National Council of Educational Research and Training (NCERT) set up by the Government of India which has been given the responsibility of bringing about improvement in school education throughout the country by initiating and helping in the implementation of educational reforms. While it advises the Government of India in the matters of policy in school education, it also serves as an implementing agency for the policies accepted by the Government of India. Since education at the school level is mainly controlled by the state governments, the NCERT can implement the reforms only through the state government through a process of discussion and persuasion as does not have any administrative power in the control of education. Research is an important part of the work of the NCERT as it has to convince the state governments on the worthwhileness of a reform on the basis of results of research.

B. On-Going Researches Conducted by NCERT

Research in curriculum and methods at the NCERT is mostly of formative evaluation type. In the following pages some of the important reforms in education undertaken by NCERT and the research conducted therein are described. These can be grouped under the following heads:

a. Improvement of Science Teaching
b. Improvement of School Curriculum
c. Development of Textbooks and their Evaluation
d. Improvement of Teacher Education
e. Use of Educational Technology.

1. Improvement of Science Teaching

About twenty years ago Science was not being taught at the primary level in the schools in India. The NCERT developed instructional materials in Science for the primary level. These were tried out in a few selected schools in the city of Delhi. The teaching-learning process in these schools, with respect to these units in Science, was carefully observed and evaluated. As a result of this the content and methodology of teaching Science at the primary level was modified and experimental editions of Science textbooks for primary school classes were prepared using the activity approach. Along with this an inexpensive Science kit was also developed at the NCERT to demonstrate the experiments mentioned in the books. These books and materials were tried out in a large number of rural and urban schools all over India and were finally revised. The revised versions were implemented as a pilot project in 50 primary schools and 30 middle schools in each state in India. This was done after the science teachers in these schools were trained in the use of these books and materials. After an experimental phase of five years, these books and materials were introduced on a wider scale in a larger number of schools in each state and in the third phase they were introduced in all schools. At each phase there was evaluation of the pupils' response and the teachers' response to these materials, and they were revised.

2. Improvement of School Curriculum

With the success of the improvement of science curricula, NCERT began to look at the other subject areas of the curricula. Attempts were made to improve the content and methods of teaching, Social Sciences, mother-tongue and English. A Committee of experts was also constituted to look at the total curricula of the schools. Conceptual framework of school curricula for the first ten years of school was developed as a result of much study and deliberation at the national level. This Curriculum Framework identified the areas of study at each level, their objectives and scope, the time to be devoted to each area in the school and methods of teaching, and evaluation to be adopted. This Curriculum Framework has been the

basis on which textbooks and teachers' guides were developed by NCERT which were used by the central schools as models on the basis of which the state governments revised their own curricula and textbooks.

3. Development of School Textbooks and their Evaluation

Realizing the importance of the textbook for the implementation of the school curriculum, the NCERT tried to improve the quality of the school texbooks in all subjects and in all classes. The preparation of the textbook was done in a scientific manner by involving the school teachers and subject experts. Trial editions of textbooks were prepared and tried out in a small number of schools and the response of pupils and teachers in these schools were carefully observed and evaluated. On the basis of this observation, the contents in the books were revised and the books were released for wider use. Even while they were being used widely, the books were also evaluated using scientific criteria and were revised from time to time. In this connection the NCERT developed tools and techniques of evaluation of textbooks in different subjects.

4. Improvement of Teacher Education

The teacher is crucial in any attempt at improving school education. Realizing this the NCERT tried to improve the professional competence of the teacher both at the pre-service stage as well as during in-service. Realizing the importance of teacher education, the Government of India has also constituted a National Council for Teacher Education (NCTE) of which the Union Education Minister is the president and the Director NCERT is the member-secretary. Four regional study groups were formed which collected data from all the teacher training institutions in their respective regions both through questionnaire and interview and presented an analytical view of existing state of teacher education in the country. NCERT also makes periodical surveys of teacher education institutions in the country both with respect to its quantitative as well as qualitative aspects and publishes reports of these studies. Based on the deficiencies indicated in such studies, certain remedial action programmes are designed and implemented. Special in-service training programmes are developed and implemented to meet the deficiencies in the knowledge of teacher educators. The NCERT has made an extensive study of teacher behaviour and teacher effectiveness and developed tools and techniques for improving them. The NCERT experimented for research purposes, a model of microteaching without using hardware wherein the feed back was given verbally using certain observation schedules. This model was found to be effective in improving the skills of teaching. As a result of these researches NCERT has been trying to implement in all teacher training institutions this model of microteaching.

5. Use of Educatitional Technology

In the NCERT, there is a continuous effort in preparing material-aids to

supplement the textbooks. Science kits as well as slides, slide-cum-tape, film strips and films based on the curriculum topics are regularly being produced and made available to schools. The effectiveness of these aids is studied from time to time and they are either modified or new aids are prepared. The Radio is used extensively throughout India for educational programmes. These are broadcast during school hours and are listened to by the pupils of the particular class for whom they are meant. The NCERT from time to time conducts evaluation of these programmes and provides the information to the agencies which make the programmes. The NCERT has also conducted an experimental project in the teaching of the mother tongue (Hindi) to primary school children using Radio. The project was implemented in all the primary schools of three districts in one state over a period of three years. Preliminary evaluation showed that the children in these schools had higher ability in the language skills than in schools not using the Radio programmes. The television is also used for educational programmes in the states where television service is available. The NCERT conducted studies of the effectiveness of school television programmes of Delhi and the results were made available to the organizers of these programmes. Necessary corrective action is being taken on the basis of this study. During 1975 an American Communication Statellite ATS-6 was placed over the sky in India for a period of one year for an experiment in television. Using this Statellite educational TV programmes were developed and telecast to 2400 villages in six states. The NCERT developed a TV programmes for in-service training of primary school teachers in the teaching of Science, which were telecast through the Statellite. This was preceded by training of supervisors, who, in turn, conducted orientation training of the primary school teachers using the multi-media package. The evaluation studies on the programme of teacher training indicated significant growth in the professional competence of the teachers in teaching Science.

6. Education through Correspondence

During recent years some Boards of Teacher Education and some universities have offered correspondence courses to enable persons who have discontinued formal education and employed in some jobs to continue their education through correspondence. The NCERT helped these Boards of Secondary Education in training the correspondence lesson writers to write these lessons using the principles of self-instruction and programmed learning. It has also conducted research studies to evaluate the effectiveness of these correspondence courses. The results of such studies are made available to the respective agencies for improving their correspondence education programme.

C. Other Concerns of NCERT

Besides conducting research in its different departments, the NCERT also

provides financial support to educational research conducted by institutions outside the NCERT. For this purpose it has developed certain guidelines for supporting research and has specified the priority areas of research which it would support. These priority areas are: Universalization of Elementary Education, Supervision System, Improving the Effectiveness of the System of School Education, Effectiveness of Teachers, Pedagogic and Learning Processes, Curriculum Analyses and Development, Stratification of Schools, Studies of Innovations, Relationship of Vocationalization to Employment Opportunities, and Studies of Abilities of Rural, Tribal and Urban Children and Their Relation to Curriculum.

No attempt is made here to present reviews of specific research studies as there are a very large number of such studies and it would not be possible to review them in a short paper. The reviews of such studies have been published in two volumes entitled 'Survey of Research in Education', and 'Second Survey of Research in Education' by Dr. M. B. Buch of the University of Baroda. The NCERT has undertaken to publish further volumes on the review of educational research in this series. The NCERT also publishes two journals in which the summaries of research studies are published: they are, 'Review of Educational Research' and " Journal of Indian Education'. Besides, the NCERT publishes popular journals for school teachers entitled 'Primary Teacher' and 'School Science' wherein also new methods and techniques of teaching and new content areas are discussed. In this way, the NCERT, in collaboration with state governments and universities conducts research studies regarding the implementation and evaluation of reforms in education and disseminates the results of research among the educational personnel.

ROLE OF EDUCATION BACKGROUND FOR DEVELOPED POSITIVE ATTITUDE IN ENVIRONMENTAL CONSERVATION

Meilus Rivai
Indonesia

I. Introduction

Research has been done in Indonesia to improve and solve many problems in education and evaluation. Likewise workshops and seminars in the provincial and national levels have been conducted. These have been done by the Ministry of Education and Culture in order to have better education methods and system through the conduct of educational research.

In the province the organization JP3K (Research Network for Education and Culture) has been developed under the coordination of BP3K(national level). This paper is one of the simple education researches conducted by this organization.

Background of the project

Idjah Soemarwoto, Otto Soemarwoto and Koesma (1975) state that Environmental Education is important to be developed in formal education from the elementary level to the university, in departmental courses and in non-formal education. This is urgently needed because of the problems of erosion, contamination of water by rubbish or micro organism, and the protection of certain animals. Indeed, this concept of environmental conservation has been discussed in Ecology as a part of Biology but it is rarely discussed in full length although it is of great significance.

It has been observed that in recreation areas throwing waste materials freely and other things are common, and developing student's attitude towards envrionmental conservation seem futile. To prevent this problem, it is necessary to explain to them the aims and meanings of environmental consevation. Therefore, basic education of Ecology is absolutely needed. Both teachers and students must have this basic knowledge in order to avoid problem related to environmental conservation.

On the basis of this problem, it is desirable that their knowledge and understanding of ecology and environmental conservation and as well as their attitude towards the problems must be studied. It is hoped that results of such studies can be inputs to Government Institution for formulation of policies and decisions in education which will take care of this problem regarding the attitude of the young generation in general in the development of environmental conservation and recreation activities in particular.

II. The Aims of Research

A. Target/Aims of the Research

This research aims to know:

1. Students' knowledge of ecology and environmental conservation.
2. Students' perception of ecology and environmental conservation.
3. Studenrs' attitude towards conservation and ecology value.
4. The relationship between students' knowledge of ecology and environmetal conservation with their attitude towards the value of conservation and ecology.
5. The relationship between students' perception of ecology and environmental conservation with their attitude towards the value of conservation and ecology.

B. Research Expectations.

It is hoped that from this reseach, the following data will be generated :

1. Level of their knowledge of ecology and environmental conservation.
2. Their understanding on ecology and environmental conservation.
3. Their attitude towards conservation and ecology value.

III. Research Results

Based on the data gathered, the following findings were revealed:

A. Student knowledge in Ecology and Environmental Conservation

Data reveal that:

1. 55.4% of subjects of ecology and environmental conservation has been understood on the average.
2. About the same percent of knowledge between males and females represented by 55.6% and 55.2% respectively. Senior High School students seem to have mastered the subjects more than the Junior High School students with 58.2% and 54.7% respectively. Therefore, it can be seen that there is only a very little difference of understanding between the male and female students of Senior High School.
3. Junior High School students in the cities give higher value in understanding of subjects of ecology and environmental conservation compared with the students studying in residences. This is evidenced by the average of 55.7% in the cities and 53.8% in residences.
4. The females got higher scores of understanding than the males. But this difference is not significant.

B. Students internalization of Ecology and Environmental Conservation

1. From the data collected, it is evident that the Senior High School students have deeper sense of values of environmental conservation compared to

the Junior High School students. This is shown by the score of 70.7% sense of the knowledge for the Senior High School students, and 66.0% for the Junior High School students.

2. Junior High School students in urban areas internalize ecology and environmental conservation more than the students in rural areas as shown by the values of 67.0% for students in the urban areas and 64.8% for those in the rural areas.

It is quite evident that Junior High School students in the capital of residences internalize ecology and environmental conservation more than the students in the center of Kecamatan or villages. This may be attributed to the fact that schools in the capital have more complete laboratory facilities and teachers are of good quality and quantity.

C. Student attitude tn ecology and environmental values

This aspect includes attitude or the way they think and behave about environmental conservation. Data on this show the following:

1. Male students of Senior High Schools have better attitude toward environmental conservation.
2. The attitude between Senior and Junior High School students showed that the Senior High School students had better attitudes than the Junior High School students.
3. Junior High School students in urban areas have better attitude to environmental conservation than the students studying in residences.

IV. Conclusions and Suggestions

A. Conclusion

From the findings, the following conclusions can be drawn:

1. Senior High School students' understanding of environmental conservation is better than those of Junior High School students.
2. Students living in urban areas have better understanding of Ecology and Environmental Conservation than the students in rural areas.
3. Senior High School students internalize Ecology and environmetal conservation better than Junior High School students.
4. The students in urban areas internalize ecology and environmental conservation better than the students in rural areas.
5. Senior High School students have better attitude towardes the values of ecology and environmental conservation than the Junior High School students.
6. Students in urban areas have better attitude towards the values of ecology and environmental conservation than the students in rural areas.
7. The better their understanding of ecology and environmental conservation, the better their attitude towards the ecology and

environmental conservation.

8. The better they internalize ecology and environmental conservation, the better their attitude to the values of ecology and environmental conservation.
9. There is no significant difference between the male and female attitude towards environmental conservation.

B. Suggestions

From these conclusions, the following may be presented:

1. There should be a continuous increase in the weight of Junior and Senior High School curricular content in ecology and environmental conservation.
2. There should be coordination in the information between Agricultural and Forestry Services, with Educational Services in developping students' attitude especially in ecology and environmental conservation.
3. Further research should be made on the evaluation of ecology and environmental conservation curriculum.

STATUS OF DEUCATIONAL RESEARCH ON TEACHING METHODS AND SYLLABI: DEVELOPMENT IN THE NEW SCIENCE AND MATHEMATICS CURRICULA

Hideo Nara
Japan

A. Some Main Issues of Studies on School Teaching

In 1980 the Course of Study for elementary school was revised and has been enforced. The new Course of Study for lower secondary school and upper secondary school became effective in 1981 and 1982, respectively.

In teaching the new mathematics and science curricula, as well as the curricula of other subjects, the following questions are presented by teachers in schools:

a) How one is to define the aim and the method of evaluation of the new curriculum, when each school is setting its syllabus along the new curriculum independently.

b) What aspects of the new curriculum to be evaluated and how to choose a point of view in each evaluation, in order to evaluate the new curriculum as a whole and to set up a better syllabus.

c) How to set up an organization for making the best assessment of the new curriculum in a school and how to make the planning and evaluation.

d) How to arrange the results of evaluation of the new curriculum, in order to make use of them in improving teaching in present classrooms and in long-range planning in each school.

In spite of some minor differences in studies on teaching in each school, the aims of these studies can be summed up as follows:

a) Well-balanced development of each child as a whole-man.

b) Realization of the educational goals set independently at each school.

c) Providing every child a not-crammed but fruitful school life.

d) Good planning of classroom as well as extra-curricula activities in such a way that every child may participate in them willingly and voluntarily and could have a sense of achievement.

e) Teacher's proper understanding of children and of the community in which their school is located and full use of these knowledge in planning of the school syllabus and of classroom teaching.

f) Structure of school organization and school administration for planning a good school syllabus and effective classroom teaching.

B. Comments on the Teaching of Arithmetic and Mathematics in Schools

1. Provision of Instruction

All the mathematics teachers as well as the science teachers are concerned with the question of how a teacher is to give proper instruction to each child or student according to his stage of development. There are various types of conception of "instruction according to individual stage of development". Some identify this with "instruction according to individual abilities" and others with "instruction according to a child's or student's proficiency in the given topics and ways of thinking properly to the topics." Although there are such different attitudes toward this question among the teachers and the schools, methods of instruction can be roughly divided into two groups:

a) instruction given in individual learning classes to each child or student according to his needs.

b) instruction given in group study classes to each child or student according to his needs.

Under these circumstances, the teachers are concerned with the following points:

a) It is necessary to write a guidance plan for an individual child or student to help him acquire basic knowledge, skills in mathematics and to make him familiar with ways of thinking along the characteristics of mathematics.

b) A teacher should devise a teaching method suitable to each individual child or student to make him motivated for learning and to help him understand the lessons better.

c) It is necessary for a teacher to assess his teaching by taking into account progress of every individual child or student in order to make him aware of the importance of the learning process and thus arouse in him an interest in arithmetic and mathematics in order to help him reach the targets of the lessons.

2. Needs for Setting Guidance Plan for Every Individual Student.

In some schools, the students' state of progress and character as well as the ideas, aims and methods of guidance, are being studied in order to make guidance planning for every individuals. This is usually done by observing and analyzing students in their daily life in order to grasp the characteristics of his stage of development. It is felt that these characteristics of the stage of development would be of great use in helping him learn. Studies on children's states of development are undertaken through observation of their readiness to learning activities in the classroom and in the various activities related to achievement.

Other studies are now being undertaken by some earnest teachers who are interested to know each child's main interests. Some of them have carried out

various surveys such as studies on interests in learning, and their willingness to learn. Others have observed carefully children's responses and activities in classrooms and presented their studies at professional meetings.

3. Toward Detailed Studies on the Idea, Aims and Methods of Guidance

In order to make the golas of learning and the process of the goal clear, flow charts have been used in drafting teaching plans in schools. In some other schools, the Outline for School Teaching Guidance and other references for teaching published by the Ministry of Education and other publishers have been used to define the goal of teaching of arithmetic and mathematics.

There are also schools now trying out other researches, such as examination of basic and fundamental topics of the subject and selection of important topics for the courses. These efforts have a common characteristic, in that there is an orderly arrangement of topics to be taught in the classroom in the form of detailed teaching plans.

4. Acquiring Basic Knowledge and Skills of Mathematics

It is very important for a teacher to make his pupils interested in the subject and let them learn on their own initiative. Teaching through task assignement has been found very helpful for such purpose. Each task should be presented to the student in such a manner that they would be interested in the task and start having their own questions about the task so that they may be motivated to work on the task. The teacher should watch them very closely in this stage of understanding the task.

For the process of working on the task, small group learning through discussions and cooperation among pupils is being tried out. At the same time, new teaching materials, equipment and techniques are being developed. Utilization of educational radio and TV programs is an example of such a new teaching technique.

Teaching through task assignment can be summarized as a series of the following processes:

(Having interests in the task and start asking questions on the topics) ⟶ (Participating in the work)⟶(Appreciating the sense of achievement)

Teaching through task assignment could also be applied to teaching according to individual needs. In this case too, it is very important for a teacher to let each student understand the given task. Some teachers are making their students guess the solution or set hypothesis in advance.

5. Evaluation of Teaching According to the Development of Individual Student with Emphasis on Hearing Process.

Planning of teaching by taking into account the stages of development of students is a common concern among teachers. Efforts of these teachers in planning

of teaching can be found in the plan of continuous teaching, development of new teaching materials for application to problems and so on.

There are more teachers now who are trying to devise better methods of assessment of students' interests in arithmetic and mathematics and mathematical ways of thinking in the process of learning. These teachers are emphasizing that educational assessment should be an integral part of teaching.

6. Operational Activities suited to the Development of Students and Their Educational Effects.

There is an increasing number of studies which are trying to promote the educational idea of operational activities and emphasizing their educational value. It is hoped that based on the results of these studies, the operational activities according to student development would be applied more to classroom teaching. It is also anticipated that not only physical but mental or abstract operational activities would be studied closely and tried out in classrooms.

Other new developments in the fields of teaching and learning include educational broadcasting and the use of various educational equipment such as OHP and educational media. Although these factors are expected to be included in studies on educational evaluation, the immediate interest among practicing educators in Japan today is how to assess every student's state of learning when his teacher fills in the column for "the state of learning" in "the record for educational guidance" introduced with the new school curriculum by the Ministry of Education.

C. Comments on Teaching of Science in School

In science teaching, the general objectives are to encourage the students to learn the subject on their own initiative, to observe their natural surroundings carefully, and to love nature so that they find the value of life. In the teaching of the new science curriculum, the following questions are presented by teachers in schools:

a) How to organize a whole course of science particularly the units of the course, in order to make the students learn the subject on their own initiative.

b) How each school may define teaching points to be emphasized at each grade and school levels, namely elementary, lower seconday and upper secondany school levels, and to correlate the teaching materials to the units of the course. Then, how to plan the yearly teaching schedule is also important. In upper secondary schools, the science teachers are working hard in organizing teaching materials and devising new teaching methods for a new subject, "General Science" introduced in 1982 when the upper secondary school curricula was revised.

c) How teachers may encourage their students to think freely, to observe

nature on their own, to have doubts and formulate questions on nature by themselves in order to try to solve them. Then it is necessay to prepare the situations for such activities, and to help students utilize these activities to make them interested in learning science.

1. Promotion of Creative and Scientific Methods for Observing Objects and Phenomena in Nature, and Promotion of Scientific Thinking.

In many schools, teachers are reexamining the targets of learning and their organic relations and developing new teaching materials by using them in actual classroom situations. These efforts are very useful in helping their students recognize nature as an organic unity and in helping them develop their abilities to understand nature. Among these e[illegible]s, local study projects, in which students go out into the fields near their schools and study the nature there, have been a great success.

The main purposes of these projects are to make the students have deeper understanding of nature and develop scientific ways of thinking through proper organization of teaching units and systematic and developmental teaching. In most of these projects, a target is set for each itemized objective, by presupposing various stages of development of students' understanding. There were some criticisms in the past on such teaching that steps of learning are divided too finely. Such criticisms, however, may not be applied to most of these projects. This process is schematically presented in Figure 1.

Figure 1

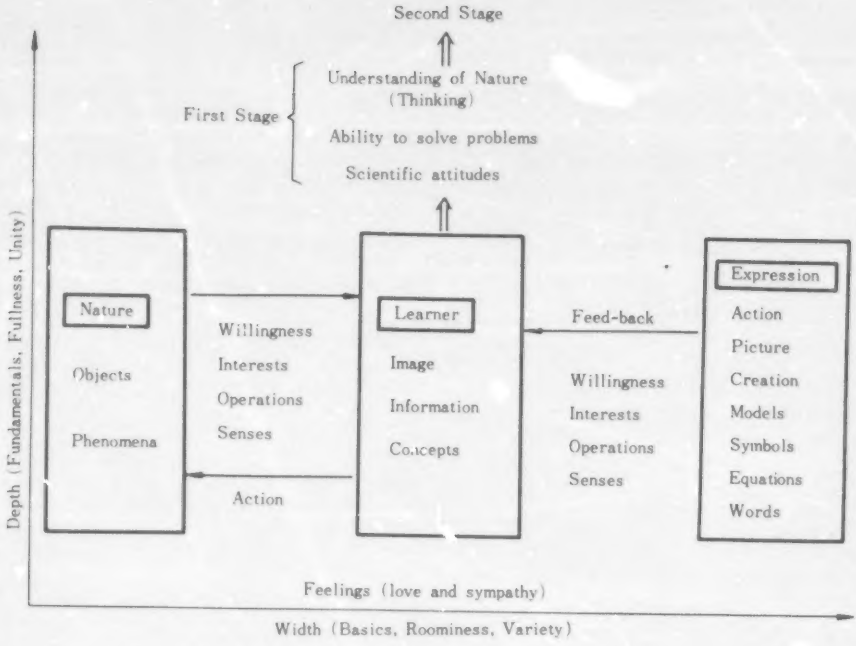
2. Planning a Yearly Teaching Schedule and Development of Student's Facilities to Understand Nature.

In Japan, some teachers have realized that clearly stating the objectives and the points of emphasis of teaching would help students not only deepen their knowledge and understanding of nature, but develop their attitudes and facilities in order that they may not only study but love nature as well.

The yearly teaching schedule should be planned in such a detailed way that a schedule for every teaching hour has its teaching target, teaching items and settings of situation for activities. These detailed contents should be arranged such that they are integral parts of each unit of study. In other words, more yearly teaching schedules are moving toward "The teaching schedule with emphasis on systematic development".

3. Science Teaching with Emphasis on Problem Solving

Many science teachers are following the science teaching which provides students with opportunities which will motivate them to study nature. It is expected that such teaching would help the students to have wonders and doubts on natural objects and phenomena and formulate questions and try to solve them. This type of



teaching has been quite successful.

Some science teachers direct their attention to the studies on teaching of social studies, and are trying to apply teaching methods developed in this field in the teaching of science. A series of activities in social studies such as collection and processing of information and drawing judgement based on the information have some similar features in the series of activities in science collection of data through active observation of natural objects and phenomena, comparison of these data, understanding of mutual relations and regularities in them. Such activities would help students think scientifically.

Another factor which enriches science teaching in Japan, is the rapidly developing educational technology. New types of educational equipment are spreading rapidly through the country and various new educational media including educational broadcasts are becoming important parts of teaching in the classroom. These new trends force teachers in school to reorganize classroom situations to present a variety of such new educational information.

D. Future Studies on Science and Mathematics Teaching Along the Guidelines of the New Teaching Curriculum

There are few trends in which studies in science and mathematics teaching in Japan will follow.

First, the syllabus will be continuously reexamined in relation to the objectives of teaching and teaching materials used in the classrooms. In science, teaching materials for local studies will be emphasized.

Second, unity, continuity and possibility for student's further development will be more emphasized in teaching plans. The yearly teaching plan will be reexamined as an integral part of consistent education through elementary, lower secondary and upper secondary schools, as well as a part of the life-long education.

Third, there will be more studies on development of students' willingness to learn and on learning attitudes.

In all studies mentioned above, integration of planning, teaching and evaluation will be stressed.

RECENT NATIONAL POLICY FOR THE SCHOOL CURRICULUM REFORM AND RESEARCH IN JAPAN

Ikuo Arai
Japan

A. Recent Reforms of Education in Japan

1. Expansion of Education

Education in Japan has expanded so remarkably in quantitative terms in recent years. Approximately 94 per cent of those who have finished compulsory education, which comprises six year elementary, and three year lower secondary schools, with enrollments accounting for more than 99.9 per cent of all children of six to fifteen years of age, so on to upper secondary schools, having almost doubled during the past thirty years. The upper secondary school has virtually become an educational institution which enroll nearly all young people between the ages of 16 and 18. The proportion of upper secondary school students going on to institutions of higher education accounts for about 37 per cent of the corresponding age group, having risen nearly four times during the last thirty years, although there is a trend for it to slacken for the past two or three years. Specialized schools or "senmon gakko", instituted in 1976 for the purpose of meeting the people's needs, are also developing as a new type of post-secondary schools. If these specialized schools are included, the proportion of upper secondary school graduates going on to institutions of post-educational institutions, amounts to more than 50 per cent.

Moreover, people are now more convinced of the idea that all should study continuously throughout their lives, even after graduating from school or university, with a view to improving their vocational skills, enhancing their cultural standards and making their lives richer in order that they may adapt to the rapid social changes occurring in recent years. In order to satisfy people's growing aspirations for such life-long learning, steps have been taken to expand and improve various facilities for non-formal education like citizen's public halls and for the training of educational leaders expected to work in such fields.

The in-service training provided to newly employed workers has also been playing an important role in imparting the basic knowledge and skills needed in their work.

2. Educational Policy

The rapid expansion of education, however, has come to present quite a few new qualtitative problems and these problems require urgent consideration:

a) Providing a richer and more flexible education.

b) Improving educational guidance for upper secondary school students to

meet the increasingly diversified character of the student body due to the rapid increase in enrollment.

c) Raising the qualitative standard of higher education and remedying regional imbalances.

d) Meeting the educational and training needs of those workers employed in small enterprises which do not have adequate training facilities or programmes as well as the desire for more learning of housewives, elderly people and others.

3. Measures Taken and Recommendations

The following measures have been taken by the central government regarding content and methods at elementary and secondary school levels.

1) Recommendation by the Central Council for Education

In June 1971, the Central Council for Edcuation, an advisory organ to the Minister of Education, recommended him to take appropriate measures for reforming the content and methods of elementary and secondary education and for promoting research for the reform, in its report on "The Basic Guidelines for the Development of an Integrated Educational System Suited for Contemporary Society".

In view of the present, rapid pace of change and the pressing need to improve the quality of education, a recommendation was made for a centre to be set up to promote and integrate research which pertains to educational reform, as well as to carry out a special programme of research and development on education. The following areas of research have been recommended to be conducted:

a) An integrated understanding of the various academic disciplines on child growth.

b) A comprehensive assessment of individual ability from various viewpoints.

c) The development of new educational techniques based upon theories of the learning process.

d) The improvement of educational environments in schools.

Underlying the above recommendations is the following realization:

The fundamental problems of education involve the study of human beings. It is almost impossible to make proper investigation without an overall coordination of all the relevant fields of study including education. The results of research in the fields of philosophy, sociology, medical science, and engineering are indispensable for the development of educational theory and methodology. Nevertheless it is becoming more and more difficult for the different fields of learning to be co-ordinated due to the increased specialization of learning.

There are numerous researchers and research institutes in the field of education. The research which can show the appropriate direction for educational reforms, however, has not been promoted in a systematic way or with clear objectives. In addition, neither the organization and conditions for research nor the

treatment of researchers have been sufficient to attract appropriate persons to the field of educational research. To take measures to improve organization and financing and thus to secure well qualified researchers should be the first step to be taken if the quality of education is to be upgraded.

For the achievement of the goals of the reforms envisaged in the Report it is required to make clear the theoretical and practical tasks of res arch and to promote integrated research and development through the cooperation of distinguished researchers in related fields.

For this purpose it is needed to establish a "Research and Development Center for Education". This center would promote qualitative innovation in education and help its results widely know to persons and institutions concerned. It would also choose subjects of research for long-term educational reform, allocate research funds for education, coordinate research activities, and improve the network of communication for educational research and development among schools, research institutes and universities in different areas.

2) Designation of pilot schools

In Japan, curriculum standards for elementary and secondary schools are provided by related laws and by the Course of Study issued by the Ministry of Education. The Minister of Education decides the Course of Study on the basis of recommendations submitted by the Curriculum Council which is composed of teachers, researchers and other persons of learning and experience.

The School Education Law states the overall aims and objectives for each level and type of schools from kindergartens through institutions of higher learning. The Enforcement Regulations of the School Education Law provides basic framework for curriculum development such as teaching subjects and other categories of educational programmes to be included in the curriculum. The Course of Study further prescribes the aims of each subject to be taught in each grade and the annual standard school hours to be allocated to each subject and other categories of educational programmes.

Schools, in general, must organize their own curriculum on the basis of the above mentioned legal provisions and the Course of Study, taking into consideration the actual conditions of themselves, of their local community and of the development and characteristics of their pupils. There is a legal clause, however, that practices which deviate from the above provisions can be allowed when the Minister of Education considers it necessary from the point of making researches for curriculum development and admits that appropriate educational considerations are paid.

In May 1976, the Minister of Education decided, according to this clause, to request establishing bodies (boards of education in the case of local public schools) to designate, on demand, pilot schools designed to pioneer in the research and development or testing of an idea or educational programme, without abiding by the legal provisions stated in the laws and in the Course of Study, in order to see

if it is workable and warrants wider adoption.

The tasks that pilot schools are expected to perform are given by the Minister of Education as follows:

a) To develop such curriculum that can strengthen the educational ties between kindergartens and elementary schools.

b) To develop such curriculum that can strengthen the ties between lower secondary and upper secondary schools.

c) To develop such curriculum that can meet varied abilities, aptitudes and future career of upper secondary schools in a flexible manner.

d) To develop such curriculum that can improve vocational education in upper secondary schools.

e) To develop such curriculum that can strengthen the ties between elementary and lower secondary schools.

B. On-going Experiment with "Work Experience Activities"

1. Background

The present experiment on "Work Experience Activities", is an example of the tasks mentioned in the preceding section. It will be well to remember that the development of respect for work is legally stated as one of the important educational aims in Japan. And the education for achieving this aim is being carried out through the whole school activities, and more directly, in Industrial Arts and Homemaking, a required subject in the lower secondary schools. General upper secondary schools are also requested to make provisions for students to complete suitable occupation-related subjects.

Recently, however, it has increasingly been recognised that the education for the achievement of the above mentioned aim should be strengthened due to the following situations:

a) *Less participation of children into work* - In recent years, due to changes in the social and family environments, there has been a significant reduction in opportunities for children to participate in work-related activities such as making things, raising animals and plants, and helping with housework.

b) *Knowledge-centered education* - In the actual practice of school education, there is a bias towards the mere aquisition of knowledge.

c) *Moratorium* - Due to the lengthening of the period of schooling, children have less opportunities to think seriously about their own future.

d) *Loss of interest and confidence in learning among upper secondary school students* - Particularly at the upper secondary school level, its universalization and the resulting diversification of students' abilities, aptitudes, interests and future career, have led to an increase in the number of students who have lost their interest and confidence in

knowledge-centered academic learning.

e) *Imbalanced character development* - In the case of academically capable students who find pleasure in the aquisition of systematic knowledge, it has become important to provide broad experience in real work-related activities in order to stimulate well-balanced, total character development.

In Japan, however on-the-job training is well-developed and life-long employment and age-based wages are generally practiced. Young people are hired first and usually fired last, therefore, there is no serious unemployment problem in the case of young people. Neverthless, the increase in the number of university students intentionally delaying graduation and the increase in the number of young people who easily change their occupations without settling down have raised anxiety among persons concerned with education.

2. Outline of "Work Experience Activities"

In order to provide various data to schools so that the work experience activities can be adopted in an appropriate way throughout the country, natioanl and local educational administration organs, as well as various educational organizations and educational research organizations, are carrying out experimental research. National and local educational administration organs are providing fund for the promotion of such research.

Aiming at the diffusion of work experience activities, the Ministry of Education has designated one upper secondary school (mainly general upper secondary schools) from each prefecture as a pilot school. The research practices which have been carried out by pilot schools according to their local and school conditions, can be classified into the following types in terms of content and method.

a) Setting up of a special teaching subject.
b) Environmental beautification activities in and out of school
c) Production activities.
d) Voluntary service activities.
e) Experimental learning based on individual students' interests and desires.

3. Future Problems

Although various attempts have so far been made, it is not yet possible to make conclusions as to their outcomes since such activities have been introduced only recently. The opinions of students who have participated in the work experience activities and of teachers who have been involved in the experiment have positive views. For example, one student answered to the questionnaire: "At first, I thought I wouldn't like doing such a thing, but once I got into making and raising things, it was a lot of fun." There was a student who came to realize that he had to do his share in playing some social role. There was also a student who realised the

importance of responsibility and cooperation. And many teachers support these evidences. It may not be possible yet to introduce such activities at ordinary schools since there are still a number of problems that must be solved. In order to solve these problems, it is necessary to carry out further theoretical and collaborative research.

If innovative practices are to be adopted widely, further research should be made in the following aspects:

a) How to gain understanding of parents and local authorities concerning their importance and necessity.

b) How to increase the understanding and active involvement of teachers in the practice.

c) How to give students a sufficient understanding of the nature and purpose of the practices.

d) Improvement of facilities and equipment.

e) Development of a practical format for evaluating the process and outcome of the practices.

f) How to increase coordinative relations with various organs in local communities.

RESEARCH PROJECTS RELATING TO THE IMPLEMENTATION OF REFORMS OF EDUCATIONAL CONTENT AND METHODS IN THE MALAYSIAN SCHOOL SYSTEM

Nik Faizah Mustapha
Malaysia

Preamble

In December 1980, the Hon. Minister of Education of Malaysia announced that the Ministry of Education Malaysia will be trying out a new primary school curriculum in 302 schools throughout the nation. This try-out will be closely monitored by personnel in State Education Department as well as the Curriculum Development Centre, Ministry of Education.

The new primary school curriculum will be implemented gradually starting with Year 1 in 1983, Year 2 in 1984 and so on throughout all the primary schools. The implementation strategy will be adjusted according to the findings of the current evaluation of the 302 pilot schools. The new curriculum will phase out the current curriculum and it will achieve its complete six-year cycle in 1988.

Background

The current primary school curriculum was developed in the early 1960's and subsequent changes in the education system were undertaken in an ad hoc manner. Various syllabus committees were set up and changes to the syllabuses were made without careful regard to overlapping of content and effectiveness of teaching methodologies. With the establishment of the Curriculum Development Centre in 1973, there was a concerted effort to bring about curricular changes in a more organized manner.

The Curriculum Development Centre, a Division within the Ministry of Education, has been entrusted with the task of conducting research and evaluation towards the development of curriculum materials as well as the preparation and training of key personnel involved in the implementation of new curriculum programmes.

The New Primary School Curriculum in Malaysia

In the context of the New Primary School Curriculum,the Curriculum Development Centre had carried out several experimental projects, especially at the primary school level. The data and the experiences gained from these experimental projects have gone into the development of the new curriculum.

A major research project carried out in 1979 - 1980 enabled the Ministry of Education to decide on a new curriculum for the primary schools. This research was carried out to determine the level of achievement in reading, writing and computing among Malaysian primary school children. A sample of 287 schools was chosen involving 16,806 pupils. The sample schools were chosen according to the medium of instruction (the national language, Mandarin, Tamil), site and location (urban, rural) and school size (big, medium, samall).

Paper and pencil tests were specially developed, pretested and revised to test the level of children's achievement in reading, writing and computhng. The items were closely based on the official subject syllabi and the approved textbooks used in schools.

Personnel from the Curriculum Development Centre, the State Developments of Education, school principals and classroom teachers were given special training in administering the test instruments. Personnel from the CDC analyzed the data.

The above study showed that a substantial number of children do not possess the desired basic skills which would have enabled them to participate in the learning process in the classroom. This in turn prevented them from developing healthy attitudes towards reading in particular and towards learning in general.

A follow-up study made use of the same sample to determine the variables related to children's achievement in the 3R's. This study was centred upon two main variables: the school and the children's home environment. Three sets of questionnaire were sent out to three groups: school principals, classroom teachers and pupils.

The study showed that there was a relationship between the school variables (availability of a school library, utilization of audio-visual aids and classroom management to mention only three) and the level of reading achievement. Achievement was related to the health of the child and his attendance at school. There was a positive correlation between high achievement and positive parental attitudes as well as help and guidance at home. There was a positive correlation between the attitude towards learning and achievement in the 3R's.

Thus, the CDC, with the experiences and findings of past experimental projects and the above-mentioned data, set about developing the new primary school curriculum which is on a trial implementation in 302 schools starting this year (1982).

The trial implementation in the 302 schools is itself closely monitored by the State Education Departments as well as the CDC. The latter has taken 25 of the schools under its supervision and monitoring.

The trial implementation is closely monitored to determine the suitability of the curriculum materials (syllabi, teacher and pupil materials), the suitability of the in-service training programme given to school principals and teachers involved in the project, and the capability of the present educational structure to handle the implementation strategy.

The monitoring is conducted to measure the effectivemess of curriculum materials through direct observation, interviews with school principals and teachers, and paper-pencil tests for pupils. This is to provide information regarding the strengths and weaknesses of the proposed implementation strategy.

The first half-yearly report has been compiled even though it is yet too early to say how far the new curriculum has succeeded in helping primary school children achieve the desired basic skills in the 3R's. The report has shown that the first year pupils are responsive and active, and the overall classroom atmosphere is very positive.

Conclusion

The development of the new primary school curriculum in the Malaysian context was not only based on research findings mentioned earlier. The evaluation of numerous other projects carried out by the CDC in particular and the Ministry of Education in general has also helped shape the nature of the new curriculum. Since 1973, CDC has carried out and evaluated many projects such as the Special Mathematics Programme for Primary Schools, the Supplementary Readers Project, the Unified Language Project and the Integrated Curriculum Project. These projects sought to find answers to specific questions relating to classroom management, development, organization and utilization of teaching-learning materials, and the utilization of teaching aids.

The main problems encountered by these projects had always been in the construct of the research proposal and subsequent evaluation procedures. There is a need for micro-level researches especially related to the teaching-learning processes in the classroom.

Educational Resesearch and Reform in Nepal

Prem K. Kasaju
Nepal

I. Background

The Nepalese educational system comprises five years of primary, two years of lower secondary and three years of secondary schooling. The formal age for entering school is six and at the end of the tenth grade, a National School Leaving Certificate Examination is given. Upon completion of the School Leaving Certificate Examination, students qualify for admission to higher education. However, trade schools are provided for students who do not demonstrate motivation and aptitude for the regular stream of general education.

Adult education and non-formal education programmes which emphasize literacy and skill development components are prepared and made available according to the needs and requirements of various target groups.

Programmes in higher education are managed by a national university known as Tribhuvan University. There are ten teaching institutes within the university framework. These institutes are in the areas of Humanities and Social Sciences, Business and Public Administration, Education, Law, Medicine, Engineering, Science and Technology, Forestry, Agriculture, and Sanskrit Studies. Apart from the teaching institutes there are four research centres within the university. They are:

Research Centre for Economic Development and Public Administration (CEDA)
Research Centre for Applied Science and Technology (RECAST)
Research Centre for Nepal and Asiatic Studies (CNAS)
Research Centre for Educational Innovation and Development (CERID)

The Ministry of Education is responsible for planning and supervision of educational programmes both the school and adult and non-formal education levels. The Ministry of Education has five field level regional directorates and seventy five district education offices. At the central level there is a Curriculum, Supervision and Text-book Development Centre.

The Institute of Education which is part of Tribhuvan University, undertakes pre-service and in-service teacher training programmes. The National Education Committee which is represented by top level decision makers from the Ministry of Education, the University, Planning Commission and selected educators, is the apex body for policy formulation and desision making in education. It has its own secretariat.

II. National Education Reform of 1970

In 1970 a National Education Reform was introduced in Nepal. This move was in recognition of the importance of education for development and a need for linking education to the development needs of the Country. An output of this reform was a comprehensive educational plan covering all levels of education which was drawn up and implemented in 1970. The new educational scheme called for revamping the old system of education for which it formulated plans and strategies. It was at this time that the provision of the National Education Committee was made to give policy leadership to undertake and monitor programmes of the implementation of the new educational scheme. Although educational research has already taken initial momentum prior to the introduction of the new education scheme, it gained or added impetus with particular emphasis on policy research and evaluative research after 1970. In the meantime, Nepal's efforts at education reform and innovation had a happy coincidence with the birth of APEID. Nepal has participated very actively in the development and implementation of APEID. In recognition of the crucial importance of educational research for educational reform and innovation, the Centre for Educational Research, Innovation and Development (CERID) was established as part of the National Education Committee. Later in 1978 CERID functioned as one of the research centres of Tribhuvan University.

III Educational Research in Nepal

There are a number of agencies which undertake educational research in Nepal. The major agencies involved in educational research are briefly described in the following section:

1. **Ministry of Education** : The Ministry of Education is the top organization responsible for the implementation and supervision of educational programmes based on educational policies of the government. Within the Ministry of Education there is a planning, programming and statistics division. The Ministry is at present implementing two large pilot projects. One is in the area of education for rural development which will be implemented in five districts of the Far-Western Development Region, the most difficult and underdeveloped area in the Country. The project focuses on areas such as universalization of education in the rural areas, development of appropriate teaching materials and improvement of physical facilities, development of educational programmes for disadvantaged groups and functional adult and non-formal education programmes. It has its own core staff. Research and evalution component in the form of baseline studies and continuous evaluation for feedback and feedforward are conducted as part of the project implementation itself.

The second large project that is being undertaken by the Ministry of Education is the non-formal education project which is now entering the second phase of its pilot study. The project was begun in 4 districts, but is now being extended to 16 districts. The focus of the project is the developement of appropriate materials and methods for a non-formal education programme for rural youths and adults with emphasis on the development of literacy skills which may be utilized for participation in rural development. Research and evaluation component is knit as an integral part of the programme. Review of project progress by internal as well as external agencies form the basis for formative and summative research evaluation inputs.

2. **The National Education Committee** : As the highest body for policy formulation and review, the National Education Committee requires research and evaluation inputs in various aspects of education in Nepal on a continuous basis. In order to assist in its deliberations, the secretariat of the Committee has a cell manned with quasi-research and administrative staff who support in the collection and compilation of necessary data and information. Periodically, it deputes and/or commissions university and school teachers and other educational personnel to deliberate on issues of current importance in education and prepare policy papers.

3. **The Curriculum, Supervision and Textbook Development Centre** : Its areas of work include curriculum, supervision and textbook development. The Centre is manned by a core of subject specialists headed by a senior curriculum specialist. It is engaged in the development, follow-up and revision of curriculum and learning materials. Some of the new aspects of its work include population education in formal education, moral education, development of environmental education and radio teacher training programme. It draws required manpower and resources from different agencies for undertaking research based projects.

4. **The Institute of Education** : Educational research programme of the Institute of Education may be grouped in the following two categories:

a) Postgraduate students working for their masters' degree in education are required to complete dissertations. The Institute of Education faculty directs and supervises this research. In the selection of topics for research, priority is given to areas of current relevance and in anticipation of application of research findings to current policy changes.

b) Attached to the Dean's office of the Institute of Education is a research division responsible for undertaking educational research. Its objectives are two-fold: one is to encourage the professional staff of the Institute to participate in research; and the second is to provide adequate research base for the development of teacher training programmes with emphasis on the development and improvement of curriculum, learning packages, instructional strategies, classroom management and others. The Institute is presently engaged in action research and pilot projects in distance learning for teachers and in population education programme.

5 . **Private Research Agencies** : There are private research agencies such as the New Educational Reform Associates, Child Studies Centre, Development Research Group, Integrated Development System. These organizations, with financial support from the government, social oraganizations and international agencies undertake research in education as well as other areas of social science and development.

6 . **Research Centre for Educational Innovation and Development (CERID)** : CERID was established in 1976 and now it functions as one of the research centres of Tribhuvan University. It is the premiere institute for research and development in education in Nepal. It undertakes research and innovative projects in school education, adult and non-formal education and higher education.

CERID operates under a board of management which is chaired by the vice-chancellor of the university. Other members of the board include the member-secretary of the National Planning Commission, the member-secretary of the National Education Committee, the Secretary of the Ministry of Education, the executive directors of the Research Centres and a number of other members drawn from the community of teachers and research specialists. This arrangement has been made with a view to ensure adequate inputs for planning research and reform in line with the national development goals as they relate to the respective disciplines. In order to support and facilitate planning and implementation of the projects undertaken by CERID, there is a Research Advisory Committee which is composed of members drawn mainly from professional researchers and specialists. CERID undertakes its activities in close consultation with the National Education Committee, Ministry of Education and field offices. The major areas of research in which CERID is now engaged are included here in order to illustrate the kinds of projects undertaken by it for reforms in curriculum content and methods:

a) Action Research/Experimental and Pilot Projects

(1) *Education for rural development*. A comprehensive educational scheme was developed with participation of teachers and community members for linking educational programmes to the ovarall development goals of a rural community and was implemented under the leadership of local leaders and school teachers. This project was conducted in a rural setting in the westren development region. The project focused on the development of programmes related to literacy, women, non-formal agriculture education, educational thrusts for unschooled children and school health for the benefit of community members. Emphasis was made on the use of self-reliance through the use of local and indigenous methods and materials. The project was initiated in 1974. In 1978, the Director General of Unesco vistited the projcet site. Based on the findings and experience of the pilot project, a project under the same title was developed for implementation in a much larger geographic area. The project will be

implemented for a period of five years in five districts in the Far Western Region. The project is in the first year of implementation under the direction of the Ministry of Education.

(2) *Experimental Adult Education Programme*. An experimental adult education project was carried out in 1978 with an objective of revamping the materials and methods used for it before. The project was developed, tested, implemented and monitored for a full cycle of six months. During that period, a variety of materials were developed and methods were tried out. On completion of a full cycle testing, the programme was improved upon and for wider implementation, it was handed over to the Ministry of Education. This programme is now being implemented in various parts of the country as a regular adult education programme.

(3) *Integrated Non-formal Education Programme*. This is a three-year pilot project focused on a need for raising level of awareness among the illiterate and uneducated rural people to want to participate effectively in the development and improvement of their own environment. Varieties of materials for the involvement of participants for discussion and learning groups in the form of posters, unstructured series of pictures themed around rural problems, story series, puppet skits and several other items were developed. Training was conducted for field level project staff as well as facilitators. The project was then implemented at selected locations in four districts of Nepal. Upon completion of a two year period of project development and implementation, the project was handed over to the Ministry of Education, for expansion and further implementation. The project has now entered the second stage of the pilot phase and is being implemented in 16 districts by the Ministry of Education.

(4) *Developmont of Low Cost Educational Materials*: CERID has undertaken a series of activities in this area during the last seven years. A number of workshops and seminars have been conducted for school teachers. Some of these workshops were conducted in the rural sites. CERID has also published a number of resource books with illustration of examples of materials in various subject areas. These resource books are now used by agencies such as Regional Directorates and District Education Offices for training teachers and supervisors. In 1980 a simple experimental study was conducted for which two sets of schools were chosen: one as an experimental set and the other as controlled schools. Selection of schools were based on the non-availability and non-use of educational materials. Experimental schools were given identical sets of materials in science and social studies. The teachers of the experimental schools

were given initial orientation on the use of the materials. At the end of the academic year, it was observed that there were positive gains in favour of the experimental schools as related to teacher and student behaviour, level of interest and student learning. CERID is now compiling a comprehensive resource book for teachers based on its experience in this area.

(5) *Accelerated Primary Education Programme for Out-of-School-Girls*. This pilot study was jointly initiated by the Institute of Education and CERID some nine months ago with a view to test the possibility of facilitating the participation of girls in education through non-formal arrangements. Training a group of women teachers in the non-formal methods was conducted. It is now planned to undertake a development of learning materials based on 1-5 curriculum prescribed for primary schools. On completion of this exercise, materials will be tested in a rural setting where learning groups of out-of-school girls will be organized. Eventually, the materials will be available for wider use.

(6) *Instructional Improvement in Rural Primary Schools*. This is a three-year action research project. Its early phase of implementation began in the middle of 1982. The project focuses on the development of complementary learning and instructional materials for pupils as well as teachers based on an analysis of deficiencies in instructional programmes in a number of selected rural primary schools in the plains and mountain regions of Nepal. Also, materials are to be developed for the use of parents. Project staff are now engaged in a critical analysis of the deficiencies in the instructional system based on curriculum review and observation of instructional programmes. In this process, the research team will identify possible areas for enrichment in the instructional system. A group of selected primary teachers and teacher educators have participated in a preliminary workshop. This will be followed by workshops for teachers at project sites where alternative sets of materials and instructional strategies will be developed. During the implementation of the project, it is intended that a variety of materials will be developed and tested in the actual educational settings in rural primary schools. It is expected that the outcome of this research will have practical implications for the improvement of content and methods of primary education in rural Nepal.

b) Assessment, Review and Evaluation Studies

(1) *Effectiveness of Vocational Education in Secondary Schools*. A survey was conducted to gauge the effectiveness of the vocational education programme in the secondary schools. Past students were contacted

from various locations and subject areas; schools were visited for programme assessment, and teachers and other related personnel were interviewed before a final analysis was prepared. The National Education Committee and the Ministry of Education utilized the findings of the study in making changes in the vocational education programme.

(2) *Equal Access of Education to Women.* In Nepal a special scheme for training women teachers for rural areas was undertaken. CERID undertook a study to examine the areas of curriculum, training plans and procedures, and impact made by women teachers trained under the scheme. A report was submitted and on the basis of results, modifications were made and new plans were prepared.

(3) *Effectiveness of Primary Education.* The introduction of the national scheme of education in 1970, placed the first level of education as the first three years of schooling. The objectives for this level of education was set as the achievement level in the three R's, including literacy skills. The rationalle for doing this was to provide at least a minimum level of education easily accessible to a maximum number of children in the country. In 1980, a study was undertaken to assess the level of achievement of a sample of primary school pupils in the Kingdom. The National Education Committee as well as the Ministry of Education utilized the findings of this study to review the primary education status of the country. Subsequently, a series of changes have been made in the primary school programmes including the change in primary education which is now five years' duration.

c) Educational Research and Planning

(1) *Meeting Educational Needs of Young People without formal schooling.* A research seminar was organized for the purpose. The seminar was attended by high level policy makers from the Planning Committee, the National Education Committee and the Ministry of Education.

(2) *Parents' Attitudes and Expectations from Education.* A survey was conducted to pool parents' views and opinion on the content and methods of education particularly in the rural areas. Findings of this study are now available. A research seminar was organized to review the findings of the study.

(3) *Determinants of Educational Participation in Rural Nepal.* This is a two-year research study conducted by CERID. The study design was based on multivariate analysis of factors such as proximity of school, parental education, household condition and quality of school facilities. This study includes intensive analysis of elaborate data on 2200 households sampled from seven districts of Nepal. An interim

report of this study will be available in the early part of 1983. It is expected that the findings of this research will have significant implications for improvement and reform of education in the primary schools of rural Nepal.

d) Normative and Basic Research

In 1978 CERID conducted a study on cognitive and perceptual development of a selected group of children from urban, semi-urban as well as rural areas of Nepal. The study was limited to a series of tasks. The findings of research was published and distributed for utilization in curriculum development and teacher training. At the moment, CERID is now undertaking a study on cognitive and language development for ages 6-10 which will have significant implications for curriculum development and teacher training. The study is in the development stage. A preliminary report is expected to be available by the middle of 1983.

IV. Trends and Issues

In Nepal there is an emerging trend or increased acceptance of the important role of educational research and evaluation for effective implementation of educational reforms. Some of these trends and issues are:

a) In order to maximize the utilization of research for the improvement of educational programmes, there is a need to avoid overlapping and focus on integrating research efforts by different groups.

b) Educational reform is a continuous process. It may be noted that no single piece of research would adequately address all aspects of a comprehensive educational programme. Thus, there is a need to accord educational research a continuing priority.

c) Educational research requires the application of unique methods and approaches. While interdisciplinary approach needs to be employed in educational research, strengthening and promoting of the distinctive features and requirements of educational research must be adequately taken care of.

d) In order to enhance and maximize the possible contribution of educational research to educational reform, there is a need to provide continuous inputs to high level administrators and educational personnel about the importance of educational research and how it contributes to educational reform.

e) Research is not a panacea to all problems and deficiencies of a larger system. Research does not invent easy solutions to complex problems. Findings of research can be useful only when there is readiness and willingness for accepting the applicability of findings for reform and correction in the existing system. Thus, there is a need for educational

researchers as well as administrators and policy makers to be congnizant of this.

f) There is inadequate emphasis on the training of research personnel particularly with emphasis on educational reform in content and methods.

g) Involvement of programme implementors such as teachers and supervisors are extremely important in the implementation of pilot, exprimental and action research projects. Thus, there is a need to equip these personnel in objective methods and procedures of data compilation, observation, project monitoring and assessment of outcomes.

h) It is important to involve policy makers and administrators in various stages of development of research so that there is a full understanding and appreciation of the implications and importance of educational research for reform.

V. Strategies Employed for Effective Dissemination of Research

In recognition of the importance of effective utilization of the findings of educational research, CERID has adopted the following strategies:

a) Involvement of administrators and policy makers such as members of the National Planning Commission, National Education Committee and Ministry of Education in consultative and advisory panels from the very early stage of research planning. We have found that this method is helpful in getting critical appraisal of the project rationale and methods and in enlisting needed feedback and support in the implementation of projects.

b) Oraganization of research seminars when a project is completed usually with participation of high level personnel from related agencies. We have found this method also very helpful in obtaining critical analysis and assessment of the findings of research before publication and for implementation.

c) Wider dissemination of the findings of research in abstract and summary forms are being undertaken which are addressed to different target groups.

ILLUSTRATIVE RESEARCH PROJECTS INFLUENCING THE IMPLEMENTATION AND EVALUATION OF REFORMS IN EDUCATIONAL CONTENT AND METHODS

John E. Watson
New Zealand

Even in a small country like New Zealand where probably not more than 200 research projects or programmes are underway at any given time, it is not easy to choose exemplar programmes that illustrate differing patterns of staffing, management and impact.The three examples to follow are intended to bring out the contrasting outcomes which may originate from comprehensive research programmes commanding public and professional attention. In each case the directer of the research programme outlined has also already achieved a considerable reputation abroad. The prime source of the research information they have sought in each case has been pupils in the first instance, teachers in second example, and families in the third illustration.

I. **Learning in Sciense Project, University of Waikato***: (Directors, Dr. R. J. Osborne and Professor P. S. Freyberg: Project Offcer, R. Tasker)

One of the interesting features of several recent research projects in New Zealand has been the attempt to identify the reactions of learners to the teaching they are being offered, their classroom dialogue, learning styles, preferences for various learning modes, their difficulties, and so on. This project, initiated in 1979 and located at a small university, has aroused a great deal of interest among science teachers in the region, and elsewhere. Quite deliberately, it takes into account many things we have learned over the last decade or so, in responding to the justifiable cynicism which many practising teachers feel toward educational research.

In the first place, the project is directed, managed and implemented by well-qualified and experienced science teachers. Dr. Osborne is a university teacher of physics, Professor Freyberg is the Dean of the School of Education in the University and Mr. Tasker, a senior secondary teacher, is the full-time manager.

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* While this project has maintained a steady outflow of progress and working papers to teachers and other interested parties the major research papers and monographs have yet to appear. Interim papers include R. Tasker, "Learning in Science Projects: Considerations Relating to Approach and Method". Paper to NZARE Conference 1979. Beverley Stead and Roger Osborne: "Exploing Science Students Concepts of Light." Paper to NZARE Conference 1979.

He is assisted by three science graduates and others undertaking graduate degrees, and he has access to the secretarial, computing and administrative services of university. The project has been designed from the outset as a series of small-scale, in-depth projects so that : (1) good information would become available quickly to various groups of teachers : (2) the concerns of pupils, teachers, advisers and classroom observers, about the teaching of science at the junior secondary level (10-14 years) would quickly come to light ; and (3) ways might be identified quickly for overcoming difficulties.

Clearly, the project has both research and evaluation objectives, and it has been planned in three phases. First, the exploratory phase involved teachers, pupils and project team members, and used a naturalistic approach to assemble information from many types of schools about the teaching and learning of science so that those aspects requiring intensive study could be identified. Secondly, in the in-depth phase, the problem areas were subjected to intensive inquiries to bring out the sources of misunderstanding among pupils, their cognitive and affective readiness for the material taught, their view of the world and their experience in learning science, problems of motivation, or perplexities over particular concepts and topics, the significance of their teachers' knowledge of the subject matter and so forth. The third phase has been concerned with action research through a variety of small-scale studies, seeking to clarify what procedures are most sucessful in overcoming the difficulties identified, how teachers over a wide geographic area might incorporate these procedures into their teaching, the value of various form of in-service training in modifying teacher behaviour, or attitude and so on.

The project directors have recognized that the teaching of science is a promising area in which to study the cognitive development of children, and the investigations they have designed depart from psychometric and statistical models in trying to unravel the comlexities of the learning and teaching situation. It is their view that ideographic studies, based on exploring the learners' world, are likely to become major area of study in the next few years. The studies outlined at the University of Waikato have confirmed that research of this kind can indeed influence science teaching positively when it sustained by a team effort in which expertise and experience have been built up over a period of time, and where practising teachers identify and are closely involved in advancing the investigation.

II. A Reading Recovery Project: University of Auckland: (Professor Marie M. Clay and associates.)

It is widely recognized that reading and books are important in New Zealand and the average levels of achievement of our children are high. Over the past 10 years more than 40 research studies on reading have been reported; and the inspiration for a large amount of this work has come from Professer Marie Clay of the University of Auckland.

For the past 20 years Dr. Clay has concentrated her expertise and experience

at the University of Auckland on what now amounts to a small tradition of research into the early reading behaviour of children. The primary emphasis of her work, in terms of theory and research, has been to suggest that children can and do teach themselves to read, and that they actively learn from their own mistakes. Dr. Clay has therefore been especially concerned with the way children respond to the reading tasks presented to them. Under her guidance, many graduate students have undertaken research around the notion that reading is largely a matter of making sense out of texts.*

In addition Professor Clay has been interested for many years in the early detection of reading difficulties. She has therefore developed a number of diagnostic checkpoints, and the corresponding normative data so that teachers can monitor the progress of pupils. The idea has been, that when children are found not to be teaching themselves to read, then the teacher intervenes to help. Out of this background in the late 1970s, Dr. Clay created a carefully monitored development programme known as the Reading Recovery Project, for modifying teacher behaviour. It is New Zealand's most promising intervention programme to date, and once again this project has also proceeded in well-defined phases.

Initially, in 1976-77, the project was initiated with a clinical phase set up to discover, describe and test approaches that worked well with failing readers so that these could be aligned with theories of learning to read. The second task was to study, in the same way, the teaching responses of specialist teachers working with those children on an individual basis. From this clinical setting, the project moved into a school setting in 1978 and, in five very different schools, an experienced teacher of junior classes was released for full-time teaching of children, using reading recovery procedures. These teachers were trained to use the diagnostic procedures to analyze the behaviour of each child, they attended sessions of demonstration and discussion every two weeks and throughout the year, they contributed intensively to a refinement of the procedures. Incidentally, the children they were teaching on an individual basis in that year, made marked and important gains in their achievement. In the third phase, 48 schools in the city of Auckland participated in a year-long course of in-service training and intensive studies were completed on the progress of children in their care. In 1980, this course has continued and further 48 schools have been operating reading recovery programmes, as a central focus for an intensive and monitored programme of professional development for their teachers.

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* Clay, Marie M. The reading behaviour of five-year old children-a research report, *New Zealand Journal of Educational Studies*, 2(1) 1967 p. 11-31;"Language Skills: A Comparison of Maori, Samoan and Pakeha Children Aged 5 to 7 years, *New Zealand Journal of Educational Studies* 1970, 153-162; The development of morphological roles in children with differing language backgrounds, *New Zealand Journal of Educational Studies* 9(2) 1974 113-121; Reading errors and self-correction behaviour, *British Journal of Educational Psychology* (39) 1969 P. 47-56.

This intervention strategy has been planned and evaluated as a solution to the institutional problem of how to change an education system in order to undercut the incidence of reading failure.* It has not required a massive reorganization of the system, nor a delay while "experts" are trained. Teachers in these programmes have welcomed the support of intensely practical but theoretically sophisticated professional courses while they are working with children. Its success, in the minds of teachers, may be attributed to the close attention that was given to professional issues, programme requirements, precise understanding of the needs of each child and the organizational circumstances of each school. Indeed, the intense interest of teachers has been very impressive and has not gone unnoticed in the wider political scene.

III. A Sociolinguistic Survey of Language Use in Maori Households: (Dr. Richard A. Benton, Chief Research Officer, New Zealand Council for Educational Research.)

To provide a factual bais for decisions on language planning that are likely to have a profound influence on a rapidly growing segment of the country's population, the New Zealand Council for Educational Research launched a sociolinguistic survey in 1973 of the languages used in Maori households and communities. The survey involves three kinds of investigations:

a) A census of language use covering 6450 households in 23 major areas of Maori population in the North Island of New Zealand (completed in July 1978).

b) Small-scale studies of the way which bilingual speakers use English and Maori in different settings, and of their attitudes to English and Maori.

c) Studies of the syntactic, lexical and phonological aspects of Maori, spoken and written, by individuals of various ages, and in a variety of social settings, and particularly related to dialect variation.

The information to be gained from these inquiries is of great practical and political importance and the basic problem in research management has been to design a survey that would have comprehensive coverage, which would be sensitive to variations between individuals and communities, and which could be accomplished in a reasonable time, by a small research team, at a minimal cost. We believe this has been accomplished in what has been one of the largest social science tasks undertaken in New Zealand. The main responsibility for this result rests with Dr. Richard A. Benton. Dr. Benton's field training and experience was developed in the islands of the Northern Pacific and the Philippines; in more recent times his services as a consultant on bilingual education have been sought in USA, the Philippines and the South Pacific.

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* Clay, Marie M. *Reading: The patterning of Complex Behaviour (2nd edition)*, Auckland, Heineman, 1979; The Early Detection of Reading Difficulties: *A Diagnostic Survey of Reading Recovery Procedures*, Auckland, Heineman, 1979.

To carry out the vast interviewing programme in the 6450 households visited in this survey, 101 people were trained as field assistants over a five-year period. Most of these people were Maori teachers or trainee teachers drawn from every tribal area in Maoridom, and their field experience has become a significant feature of their professional development as young people. From the interviews, a vast quantity of information has been assembled on language used at home, work or school, in the neighbourhood, in religious ceremonies and so on. This information is now available for nearly 200 communities from large cities to isolated villages, and it has already helped to spark off a dramatic upsurge in public concern about the future of the Maori language. It is already being used extensively by communities as a basis for representations asking for their school to adopt a bilingal curriculum. Preliminary analyses have shown that the linguistic circumstances of Maori people are varied and extremely complex so that radical steps will have to be taken promptly to give the language greater status within schools if it is to survive as vernacular for another generation. This question of public policy has become an issue of much greater concern than we would have predicted when the project was initiated a decade ago and our research is therefore now a vital element in the over-all response of the education system.

Moreover, as in the case of the other two projects, the gradual expansion of bilingual policies, methodologies and materials is already bringing about new strategies for the evaluation of pupil progress, school management, and community support. Such obligations have stimulated new forms of collaboration between the Ministry of Education, research organizations, regional authorities, the schools, and professional associations of teachers in setting up arrangements for the annual monitoring of pupil progress. These provisions include more precise ways of assessing community support, the development of special measures for evaluation, and new procedures for reflecting the outcomes in national policies. In addition, the different phases in the regular evaluation exercises involve a range of personnel, teachers, supervisors, parents, academic scholars and research personnel who bring task- specific expertise to the judgements required over a period of years.

The Beginning of a New Era:

These three examples may be viewed then as the first signs of another era in the reform of curriculum content and teaching methods. It would be possible to provide several other illustrations of projects in New Zealand which are likely to have varying degrees of impact on other curricula implemeted by schools. Several, such as the Second IEA Evaluation of the Teaching of Mathematics have originated from a previous era of curricula change, while others, such as a number of longitudinal studies of children at risk of failure in their early years of schooling, because of immature development or handicaps, have still to make an impact. However, the purpose of this paper is to suggest:

(1) That the New Zealand education system is now entering upon a period when the tempo of change in content and method will be slower than that of the past 20 years, and of a somewhat different character.

(2) That research now underway foreshadows an impact on teaching and learning which will differ significantly from the factors precipitated change in the past two decades.

(3) That demographic changes, restrained budgets, modified social policies, and adjustments in educational objectives will increase the concern for accountability and more systematic evaluation of results, in the years immediately ahead.

Now, both in the past, and also in the foreseeable future, the role of research in advancing or monitoring major shifts in curricula reform is more marginal than many assume. As in most other countries. It was the dramatic achievement of space-age technology just 25 years age that triggered off the most vigourous period of reform in curriculum content we have yet experienced. In New Zealand, its objectives across all levels of the curriculum were:-

(1) To ensure that school curricula were responsive to a world dominated by science and technology and the social changes arising from technological innovation.

(2) To review school curricula at all levels from junior primary to the senior secondary level so that appropriate and cumulative sequences in learning occur for age group.

(3) To give particular attention to the transition from primary to secondary schooling and curricula for the early years of adolescence.

Through the 25-years period, very thorough revisions have been achieved for mathematics and science at all levels, for social studies, and very nearly also for language studies. But, unitil recently the attention given to such areas as health or physical education, art music and technical subjects has not been as consistent or as comprehensive as those of the basics. In brief, all content areas at all leve's have not been subjected to equally rigourous revision. It is evident however, that for most of this period the architecture of school curricula in New Zealand has been taken for granted and the task of reform has been viewed as orderly revisions of subjects. Challenges to these assumptions have not so far been revolutionary. Moreover, the debates have been confined mainly to the professional constituency associated with curricula reform in particular areas. The most impressive feature of reform in content and methods in New Zealand in the most 20 years has in fact been its endlessly consultative style. Practising teachers have taken a very prominent part in formulating objectives, revising content, trialing new formats, and designing new materials. In short, they have responded generously the leadership which has been given by an enterprising Curriculum Development Unit that was established in 1963 by Department of Education. But, as in other parts of the world, the impetus of this era of reform has become more restrained in recent

years, and much of the infrastructure that supported reform in earliest years has already been dismantled. In many instances, the principal actors for a new era of reform and change have not yet come on stage.

However, it is now evident that a host of new issues have already emerged to excite public interest and concern and these will almost certainly have far-reaching implications for the kinds of curricula that are developed in the years ahead. The people of New Zealand are much more aware now, for example, of the multi-cultural nature of the society their schools must serve, and the changes in attitude and behaviour required to achieve greater sex equality. The community is increasingly perplexed by the societal dangers to be faced by the youth, a world of violence, drug abuse and undisciplined behaviour, the pressures of the consumer society, the sobering realities of the job market, the microprocesser revolution, the energy crisis, and much more. Through all of these contexts, we have come to recognize that issues of moral, civic and cultural development are now likely to assume as much prominence in plans for changes in content and method as the technological pressures of 25 years ago. But these newer concerns do not fit neatly into the curricula architecture of the past and it is by no means clear that the earlier procedures for promoting and managing reform are appropriate or feasiblem in coping with them. We may be reasonably confident that our current research effort will become at least ingredients in increasing public awareness of the issues to be debate.

Children at Risk

There is another important respect in which our country's current concerns are different now from what they were 25 years ago. The message of Sputnik was that societies had to rethink curricula for those in schools who were the potential scientists, technologists and leaders in various fields. We were all then very much preoccupied which what was called the pool of talent, how to increase it, and how to ensure that potentially able students got the right educational preparation. These concerns are still important and our education system has succeeded well in fufulfiling such objectives.

But public concern is now directed elsewhere. Employment prospects have brought about a significant shift in public interest in the education system. Students who 20 years ago would have been referred to as "drop-out" or "early leavers" are now reffered to as young "at risk". Indeed, the concept of being "at risk" has already became part of our everyday language. It has already became an important stimulus to the expansion of pre-school education, advisory and guidance service, special education services and research, and in the promotion of programmes for children who may find themselves culturally, linguistically or socially at a disadvatage.

The implications for curriculum development are no less important, and the

fact the cycle of curriculum development intented 25 year ago is now virtually at an end may be a distinct advantage in dealing with the learning needs of such students. It suggests that the energies of teachers, specialist staff, research personnel and other resources may now be redirected in some instances toward greater attention to the learning requirements of children of differing attainments and circumstances. The shift therefore in our research development and evaluative work is likely to move from the teaching of content toward the problems of learning experienced by children and students at all levels, the young and the not so young in an extraordinary diversity of learning environments.

To sum up. In New Zealand there is a growing convicition that we are coming to the end of a cycle of curriculum development which has lasted 25 years and which has introduced important changes in school curricula and teaching methods. This phase of development took individual subjects in the school programme, revised them, and sought to develop them sequentially over or 12 year period of schooling. We shall continue to have curriculum development in this model, but we now doubt whether it will be the characteristic development of the 1980's. The focus is already shifting from individval subjects to the curriculum as a whole. The sorts of issues that are of concern to the public and which are now under consideration for inclusion in school curricula typically raise questions that cross subject boundaries. They call for a reconsideration of our curricula emphases. The focus has shifted too, to children who in various ways are at risk of failure and who have to be helped to succeed in essential aspects of their learning and development. Our concern for reforms in educational content and method therefore now relate more to the success with which children learn, than to the shaping of the teacher's prescriptions. It is an important change of focus.

THE PRIMARY EDUCATION PROJECT IN PAKISTAN

Laeeq Ahmed Khan & L.R. Davis
Pakistan

A. Primary Education in Pakistan - A Brief Review:

Universalization of primary education has been a fundamental objective of the Government almost since Pakistan was founded. In November, 1947 a conference of leading educationists was convened in Karachi "to survey the existing and future opportunities in the education field" and shortly afterwards the Government accepted that it was responsible for providing 5 years free universal and compulsory education. In some provinces it was suggested that education would become universal within a decade, and for the remainder universality was envisaged within two decades.

As the time progressed it became increasingly clear that these targets had been unrealistic. According to official figure, the 1970 enrolment rate was only 47.4% of the 5 to 10 year age group and in that year a new policy aimed to achieve universal education by 1980. Only 3 year later, however, the new Government revised the targets. In its policy documents the stated objective was to achieve universal male enrolment by 1979 but the goal for female would be 1984. Yet these objectives were also short lived, for only four years later, the male and female targets were reset at 1983 and 1987. Finally, the most recent statement produced in 1979 has advanced the dates yet further to 1986-87 and 1992.

The official picture of the growth of Primary Education is shown in the following Table-I

Table I: Growth of Primary Education in Pakistan, 1947-48 to 1979-80:

Year	Primary Schools	Total Enrolment ('000)	Female Enrolment ('000)	Teachers ('000)
1947-48	8,413	770	110	17.8
1959-60	17,901	1,890	370	44.8
1969-70	41,290	3,910	1,030	92.0
1974-75	51,744	4,980	1,430	125.5
1977-78	53,853	6,050	1,661	135.3
1978-79	54,544	6,570	1,730	137.3
1979-80	55,235	7,090	1,800	139.3

Sources: Ministry of Education, *Pakistan Education Statistics* (1947-1979), Islamabad, 1980, pp. 2-4; Government of Pakistan, *Pakistan Statistical year book 1980*, Statistics Division, Karachi, 1981, pp. 153-5.

It is apparent that the education system has expanded dramatically since 1947,

that the number of schools has increased seven-fold between 1947–1980, and that the enrolment has increased nine-fold.

During the period 1966–78, primary school enrolments expanded at an average annual rate of 4.8% to raise the overall enrolment ratio from 40% to 45%. However, substantial inequities in access exist by sex and region. The lack of educational opportunities for girls is reflected in their low initial enrolment in primary schools (47% never enroll), and for rural people generally by the limited coverage of schooling in rural areas. Access is affected by the system of separate boys' and girls' schools outside most urban areas, which contributes to unequal school density (square miles per school) for males and females. Female density, for instance in Sind and Baluchistan is only about 20% of male density, and for the nation as a whole, it is only 45%. The unequal provision of facilities is reinforced by the unbalanced distribution of teachers, showing surplus of female teachers in some urban areas and shortages in neighbouring rural schools.

The last few decades have witnessed, therefore, progressive improvement of proportionate enrolment rates, but in absolute terms there are more primary children out of school than ever before. The 1981 census revealed the total population to have doubled in the previous 20 years to reach a total of 83.8 million; and the annual compound growth rate of 2.98% shows no sign of slowing.

Quite apart from the population growth factor the causes of Pakistan's failure to meet either the quantitative or qualitative targets for primary education are complex. They involve multiple economic, social and educational factors which are interrelated.

Educationally, a critical factor in low enrolment and high dropout is the poor quality of instruction and resulting low learning achievement. High rates of teacher absenteeism, a reflection of lax supervision, contribute to indifference among students. Teachers tend to be ineffective in covering the curriculum because they lack proper training and they have insufficient and inappropriate instructional materials. Studies in other Asian countries point to availability of good teaching materials as a crucial determinant of learning achievement. About 60 per cent of all primary schools in the country have not met the minimum accommodation requirements. There are many schools which do not have any accommodation at all and function in 'open air'. These schools continue to move from one location to another in search of shelter against severe heat, cold and rain. Female teachers are in short supply in rural areas, and teacher absenteeism is reported to be rampant. In many cases, teachers, particularly women, remain on the payroll of rural schools without ever going there. Many female teachers do not stay in rural areas because of the feeling of insecurity caused by the lack of covered accommodation for the school. Thus, there are many schools which remain without teachers and exist only in the official records. The administrative machinery, though fully aware of the situation in each area, does not adopt any corrective measures. The supervisory arrangements are not at all geared to offering any assistance or guidance to

teachers on educational matters. Instead, the supervision/inspection is law-and-order oriented and is generally carried out in response to local complaints. Because of poor means of communication, absence of reasonable facilities of travelling and preoccupation of supervisory staff with such administrative responsibilities as disbursement of salaries, no system of school supervision seems to exist and no one knows what goes on in most of the schools.

B. The Primary Education Project - Its Design

The Primary Education Project is an experimental project designed to determine the best way of overcoming the major problems in primary education outlined above. It is intended to plan out a formative and summative evaluation of project implementation which will identify which factors, or combination of factors might be introduced most effectively on a national scale. It is hoped also that the project may indicate what modification of factors or what introduction of new factors not included in the project design may also be considered for future experimentation and incorporation into the national system. The project, therefore, constitutes a first phase, namely experimentation and evaluation, to determine the most effective way of overcoming the major problems in primary education. It is designed to pursue four major objectives.

a) *Increased access* to primary schools, especially for girls and for rural poverty groups; this sought by (i) providing school facilities and materials; (ii) providing more female teachers; and (iii) enhanced supervision intended to improve school-public relations and overcome parental indifference to enrolment;

b) *reduced wastage*, principally by reducing dropout and repetition, through improved facilities, materials and instruction, and supervision (to reduce teacher absenteeism), and by working with parents and community leaders to avert dropout;

c) *improved quality instruction* to attain higher and more lasting pupil *achievement* through (i) recurrent in-service teacher training in methods of teaching and classroom management designed to make better use of school time, and (ii) local, more frequent supervision.

d) *reduced costs* by reducing wastage inherent in dropout, introducing lower cost teachers, and moving towards larger class and school sizes.

The project has adopted a limited approach to these objectives: coverage is low enough to avoid large-scale investment in unproved approaches, yet large enough to provide statistically significant experimentation and research. The project fosters the development of local research capability by extensive involvement of local staff as project researchers in the experimentation and evaluation aspects of the project. Special training is provided for this purpose. Local staff of universities and Institutes of Educational Research thus gain

expertise and experience to enable them to implement subsequent phases of any long-term improvement programme.

To attain its objectives, the project provides assistance to the central and provincial governments in four components to:

- improve the quality of the teacher service,
- expand supervision,
- improve instructional materials, and
- provide physical facilities.

Overall, this first phase project includes more then 4,000 schools, nearly 10,000 teachers, and over 398,000 presently enrolled students and about 400,000 children who are not now enrolled, of whom over 70% are females. The project is limited mainly to rural areas; it covers 7-8% of the nation's primary schools, teachers and enrolled children.

The project as outlined above is designed to permit experimentation attempting to answer the following five questions:

a) Whether (i) provision of female teacher residences, and (ii) establishment of assistant teachers can aid recruitment of female teachers;
b) whether increased training of teachers results in improved pupil achievement;
c) whether improved supervision reduces teacher absenteeism;
d) whether increased contact between parents and teachers results in greater enrolement and less dropout (especially of girls); and
e) whether per student costs can be reduced through use of teacher assistants and movement toward larger class and school sizes

Measurements to answer these questions can be divided into five categories:

a) data on population, enrollment, pupil and teacher attendance, dropouts and repetitions secured from schools through management channels and school mapping capability;
b) benchmark tests of pupil achievement and attitude, and tests of teacher knowledge and competence;
c) measures of perceptions and attitudes of parents and community members on education and schools;
d) cost data (national, provincial and by district and school); and
e) Qualitative studies concerned with process rather than product evaluation.

C. The Primary Education Project: Its Implementation

One may discuss the implementation of each of the inputs of the Primary Education Project from two points of view. The first is a question of how much of the planned input is in place, and what are the prospects for the remainder. The second is concerned with the degree to which the implementation of the input has afforded important opportunities to observe the inputs potential in terms of a

prescriptive or action proposal.

The expanded supervision that the project is trying to provide is one of its most distinctive features. It consists of the introduction of one of two additional supervisory positions. The goal is to increase the frequency of visits from at best one a year to as many as 50 per year.

Because of the highly innovative nature of this component (and with a view, no doubt, to its potentially high recurrent costs), a wide range of supervisor/school ratios was included in the project design. Opportunities have been created for evaluating and comparing a number of different supervisory models, as described below.

One of the schools in each cluster is designated as its "center school." It serves as the disssemination and collection point for information to and from the teachers, and as the distribution point for pay. In connection with the latter function, the Learning Coordinators hold monthly meetings of all of the teachers in their clusters. To house these meetings, one of the new classrooms allocated to Punjab was built at each of the center schools, and furnished with tables and chairs.

Although implementation has taken place at the appointment level, the failure to implement the project proposals for providing transport to all supervisors and learning co-ordinators (jeeps, motor-cycles and bicycles) makes it difficult at the moment to evaluate the potentital contribution which such unproved supervision can make towards the achievment of project objectives. However, the vehicles and motor cycles have recently arrived in Pakistan and should be delivered to the project implementation units very soon. There may still be time, therefore, before being required to make prescriptive proposals in June, 1983, to assess what a fully mobile (or mobilized) team of supervisors and learning co-ordinators can achieve to improve the quality of primary education in Pakistan. They may even be able to help one to identify the parameters by which such improved quality can be measured.

Before closing this section of project implementation two important points should perhaps be made. The first concerns the recognition of the fact that all implementation in an experimental project such as this is partial only. It is moreover partial in two senses. The first, and less important is as a descriptor of scope. Experimental programmes almost always are implemented on a modest sample of the total population. Because the purpose is only to create opportunities for studying dynamics that may or may not point to practical solutions, it is prudent to limit the investment to the kinds and numbers of observations that are necessary to produce the information required. The second, and absoiutely crucial, is partial in fidelity. No matter how thoughtful a supervisory model is implemented, the result will not be a full and fair representation of the concept of say "expanded supervision," but only one of dozens or scores of possible variations. No matter how many precautions are taken, mishaps and slip-ups that degrade the input can *not* be avoided in the start-up stages of a new program. The inputs that are made under

the banner of "expanded supervision" will be a weak approximation of the inputs that would be made by a fully developed, second-or third-generation articulation of this concept, and weak results must be expected. An evaluation that ignores this reality, and downgrades the concept because its first, crude representation is disappointing misses the basic point of assessing a concept.

The second point concerned the recognition that one of the major weaknesses of the project as it was designed initially was that the input components were considered as discrete rather than as interconnected and mutually reinforcing.

D. The Primary Education Project: Its Evaluation

Charles D. Hopkins in "Educational Research—A structure for Inquiry" distinguishes between research procedures, evaluation procedures and development procedures on the grounds that they are prompted respectively by the need to know, the need to choose and the need to do. At the outset it was probably not sufficiently recognised that the Primary Education Project was concerned primarily with evaluation and development, the need to choose and the need to do. As a result attention during the first cycle of evaluation was focused upon classical research methodology and experimental design whereby a straightforward relationship could be demonstrated between inputs (physical facilities, supervision, training and learning materials) and outputs (enrolment, drop-out, quality improvement and low-cost). Three types of quantitative data were generated in the expectation that such relationships could be established: demographic data, pupil achievement data, and attitudinal data. That such expectations were unlikely to be realised was anticipated as early as December 1978 when a team of Consultants to the intended project wrote along the following lines.

The proposed "Primary Education Project" is essentially an action research project involving a whole series of complex innovations at different system levels operated by different personnel on different timetables. The problems of action on evaluation procedures are very well known. Unlike classical experimental research, in evaluation situations the selection and definition of the evaluation task is not under the researcher's control; precise hypotheses can rarely be generated or tested; the study can seldom be replicated; data collection is dependent upon practical feasibility and upon the continuing cooperation of many people other than the researcher; variables can rarely be controlled either by randomisation or by the use of control groups.

All of these constraints operate in the Primary Education Project evaluation context: moreover the country's educational research capacity is weak. It follows that, even given considerable expatriate assistance, the design should not be over-elaborate or over-sophisticated to be realistic and feasible. The design should be kept as process-oriented and flexible as possible. A second reason for this relates to the feasibility of the objectives. One can demonstrate clearly and accurately the

length and complexity of the interactive, causal chain from project inputs to outputs. It may be unlikely that any measurable impact on pupil achievement scores will result from this process, but it is important to treat this view as problematic and thus to try to measure any such changes particularly in terms of pupil achievement tests. However, it would make no sense to place too much emphasis on this aspect of product evaluation by spending a disproprortionate amount of the research budget on the development of achievement tests. A third reason is that in projects like the Primary Education Project elaborate product evaluation designs frequently produce findings which are trivial or uninterpretable and, therefore, unusable.

A greater emphasis, therefore, should be placed upon process evaluation rather than product evaluation. Evaluation, therefore, should be viewed as a matrix with each major project component analysed in terms of four dimensions: context, input, process and product (viz Stufflebeam, D et al, 1971, Educational Evaluation and Decision Making).

As late as August, 1982 a review mission from the World Bank expressed the view that major and fairly rapid changes were necessary in both the conceptualisation and the implementation of the evaluation component of the project, otherwise the staff tasked with the responsibility to write a comprehensive proposal document might well discover that the great quantities of data collected related to demographic, attitudinal and achievement questions in fact contained little practical information which could be used to help them in their task.

It is fortunate, therefore, that the Federal Implementation Unit, in consultation with the Provincial Implementation Units had already decided in March 1982 to introduce a number of supplementary evaluation studies of a qualitative process-oriented type and to reduce somewhat the concentration upon quantitative product oriented research activity. Included among such qualitative studies as subjects of inquiry are:

1. Learning co-ordinators and supervisors
2. The school in its socio-economic context
3. School drop-out
4. School mapping
5. The project training programme
6. A model training programme
7. The P.I.U. as an institution
8. Parent and teacher perceptions of the Primary Education Project.
9. The project's physical facilities and learning materials.
10. The concept of a resource centre
11. The concept of a centre school.

This is not to imply that the quantitative evalution undertaken with a considerable sense of industry by the P.I.U.'s has been in any sense time wasted. Certainly it has been the major force which has generated momentum in the project

and a task-oriented cohesion between the F.I.U.'s and the P.I.U.'s. It has developed a cadre of research oriented officers skilled in research procedures. Additionally, some of the data available will certainly yield interesting and worthwhile information when it is possible to compare the 1981 cycle of evaluation with the 1982 cycle in December of this year. The quantitative evaluation alone however will not and cannot provide those answers to the questions posed by the project, which it is essential to find if the project is successfully to achieve its objectives. For this reason all the qualitative research studies identified above are scheduled to be completed in time to make their contribution to the prescriptive proposals to be submited to the World Bank in July 1983.

EDUCATIONAL REFORM IN PAPUA NEW GUINEA
——THE SECONDARY SCHOOLS COMMUNITY EXTENSION PROJECT——

T. Stanley Kila
Papua New Guinea

INTRODUCTION

A theme of critical importance in understanding educational change in third world countries has been the kinds of economic, organizational and psychological concepts and structures that have served to legitimize and maintain Western educational superiority and dominance in these countries. Western education, Western concepts of the purposes and nature of national developement, and Western technology and bureaucracy are so tightly bound together (both conceptually and in the 'operational' sphere) that an understanding of the relationships between them is becoming an urgent task for third world educators.

The principal difficulty is that demands for education are always many and varied, and increasingly have to do with the establishement of educational priorities both national and international. This process points, then, to the dominance of some groups over others, whose demands are respectively met and unmet. A genuine concern to take into account the demands in education would need to look beyond governmental and inter-governmental policy regarding the aspirations of all kinds of minority groups, which cast a new perspective on the 'classic' development dilemma of whether to provide mass or elite education.

Emerging 'typical' governmental modes of promoting development and institutional approaches are now reflected in the work of international organizations including; (i) a tendency to apply technical solutions to all problems, both technical and non-technical; (ii) reliance on Western patterns of organization, Western technology, and Western aid; (iii) the adoption of formal systems and structures as the principal frames of reference for development work and education provision; (iv) a general belief that most existing social structures and organizations are intrinsically sound, in need of only relatively minor adjustments to make them more 'efficient'; and (v) a reliance on bureaucratic delivery systems and infrastructures.

It is in this context that the National Development Strategy of Papua New Guinea has been developed. Some objectives in this National Strategy find relevance to the reforms now being undertaken in relation to the secondary school programme. These objectives include the following:

a) The National Development Strategy calls for a high proportion of the nation's resources to be directed to rural areas. (p. 17)

b) The strategy aims to reduce the present uneven distribution of incomes by efforts to generate income earning opportunities in all rural areas. (p. 17)

c) The main objective of the strategy to develop rural areas will be to ensure that people have a chance to improve their well-being through their own efforts, and in their own areas. (p. 23)

d) Strong links are required to allow skills aquired in school to be applied directly to village situations. (p. 23)

e) Particular emphasis will be placed on effective education and training for the most important skills required for rural development··· (p. 29)

In the recent past, Papua New Guinea's Departement of Education has designed and instituted a number of curriculum innovation projects within the parameters of 'community-based' education.

One such attempt is the recently launched (1978-) "Secondary Schools Community Extension Project" (hereafter, SSCEP) currently being tried out in five secondary schools, funded under the National Pubiic Expenditure Plan (NPEP).

AIMS OF SSCEP

The SSCEP programme aims to provide a series of learning situations which are oriented to the development of *skills* pertinent (a) to the needs of its learning clientele-students, and (b) to the process of rural and educational development through an *integrated* practical and academic inquiry approach.

This integrated approach seeks to provide both *technical* and *intellectual* skills derived from existing core-subject syllabi and school devised practical projects (eg. coffee, fishing, gardening, trade store, nutrition, and the like) As such, SSCEP aims to make secondary education relevant to the needs of Papua New Guinea students. The programme serves to cater to main types of students: (a) the student who will continue to further formal education, and (b) the student who will return to his/her local community.

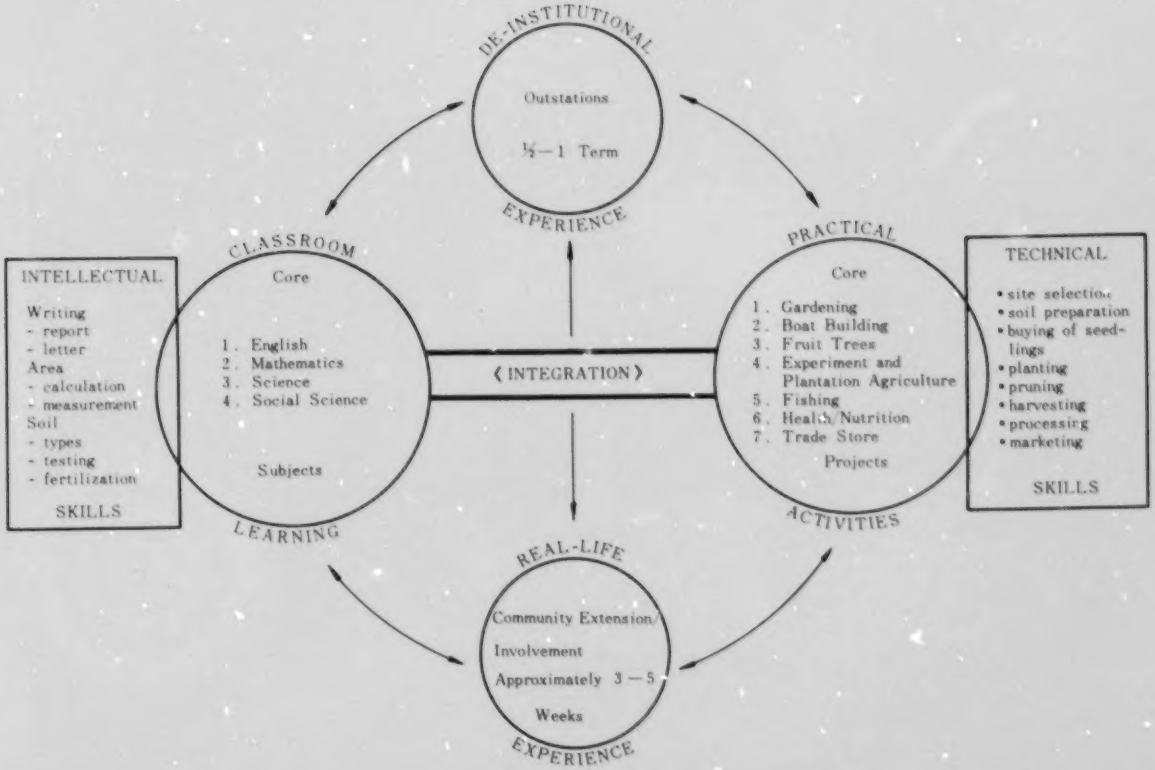
Within this broad framework Currin (1980) has classified the aims of SSCEP into four main categories:

a) *academic* : SSCEP seeks to maintain, if not to improve, the present level of academic performance in its pilot schools.

b) *vocational* : SSCEP seeks to introduce students to practical skills which are useful in village development (although it does not attempt to produce high levels of vocational skills).

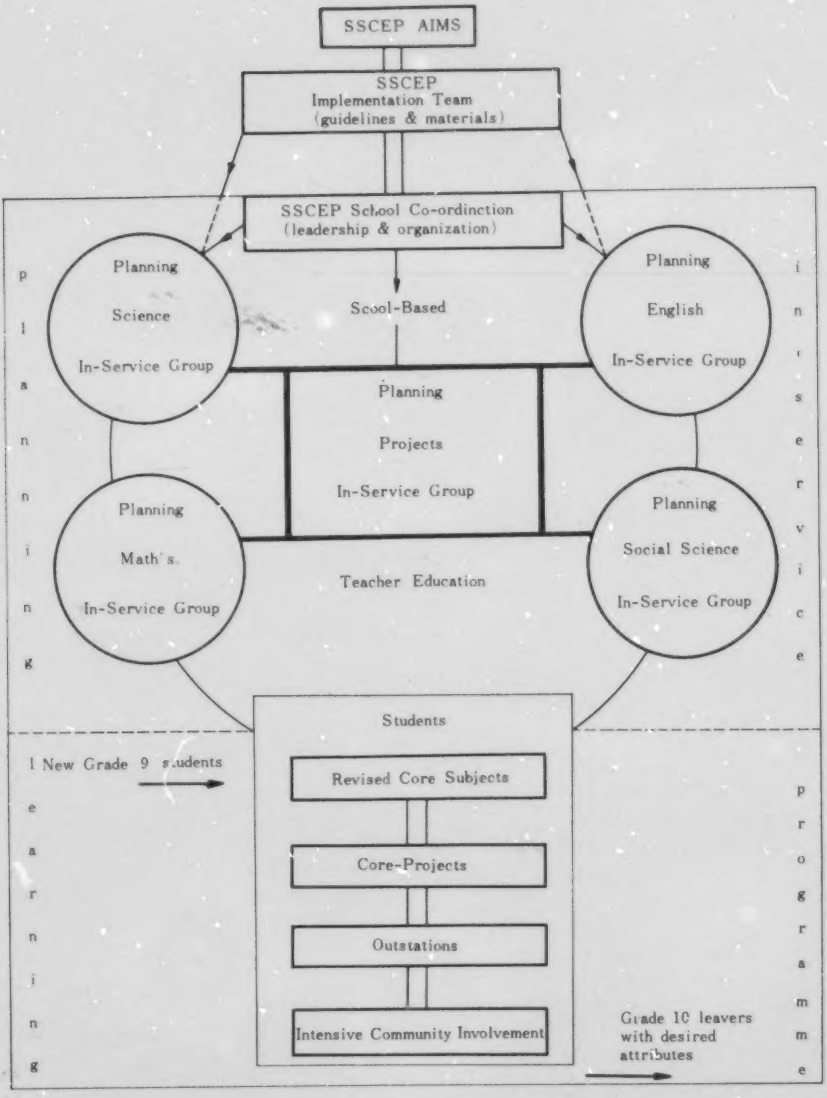
c) *community involvement* : SSCEP seeks to relate education to community development by stressing the application of learning to situations which involve students in their communities.

d) *attitudinal* : SSCEP seeks to provide learning situations which encourage the development of leadership, initiative and willingness to apply skills in solving practical problems.



The Learning Model of S.S.C.E.P.

Implementation Model



THE IMPLEMENTATION STRATEGY

The implementation strategy of SSCEP is succintly summarized by Cummings as follows:

> The implementation of a curricular innovation such a SSCEP is a complex and multifaceted process. SSCEP, in particular, has had a far from simple implementation process because it has set itself a multiplicity of goals. In general, these include developing new curricular activities, such as outstations and community involvement experiences, altering existing school activities and projects, and integrating subject and project teaching.

A general strategy for a programme to implement these changes was developed within the Department of Education between 1976 and 1978. When the central implementation team was appointed and began its work, additions and modifications were made to the original implementation strategy. These changes resulted mainly from the particular view of curriculum development held by the members of the central staff and the practicabilities of implementing this type of innovation in provincial high schools in Papua New Guinea.

The resultant implementation strategy had three major elements:

a) Stepwise approach using pilot schools and intensive school-based teacher in-service training.

b) A centralized curriculum development plan to be implemented by a small team of highly skilled experts.

c) School-based experimental curriculum development.

This strategy is only one of a number of possible alternatives. A critical study of this strategy in comparison with the possible alternatives has not been carried out. However, Vulliamy (1980, 1981a, 1981b) and Stanton (1980a) have commented in retrospect on the strategy. By looking at the points raised by these authors, within each of the major elements given above, we may answer some of questions about the appropriateness of the SSCEP implementation strategy.

Constraints / Problems

Some constraints have been identified in the operational sphere of the SSCEP programme. They have also been identified as factors affecting standards in provincial high schools. Murray's (1980) analysis confirms this short list but goes further and adds other factors. These include: (i) shortage of teachers, (ii) lack of experience, (iii) rate of turnover and transfer of teachers, (iv) imbalance of subject areas, (v) long hours of work, (vi) lack of commitment, (vii) attractions of other jobs, (viii) effect of school environment, (ix) grade 8 selection, (x) administration, (xi) teachig materials and care of them, and (xii) the teaching model.

Apart from the other operational constraints described above three main

problem areas need immediate examination (Cummings, 1982).

Probiem Area 1: Teaching Skills & Curriculum Development

The main area of concern is the ability of school staff members to develop and implement the integrated curriculum of SSCEP. Although all schools have successfully implemented certain portions of SSCEP, no school has satisfactorily operated the total SSCEP programme for a full school year. The main constraints are seen to be:

a) A lack in school staff of the necessary skills to develop and implement an integrated curriculum and community involvement exercises.

b) A lack among school staff of both an adequate commitment to the concept of SSCEP and the motivation to work hard at it, due to their formalistic and syllabus-oriented teacher training exposure and experience, and the reinforcement of this style of teaching by the inspectorate.

c) The inexperience and lack of proper training and orientation of SSCEP staff members. This has been particularly apparent in the school coordinators position, which is generally considered the key SSCEP position in school.

Problem Area 2: Assessment

The schools desperately need assistance in the area of assessment. The required guidelines for integrating subject and project assessments are not available and some schools are hardly doing this at all. They also need help in developing procedures for assessing project skill acquisition and personal development. At present, some schools do this informally in subjective observation of project groups. Individual students are often assigned marks based on their rank in the group. This subjective procedure doesn't allow for valid comparison between groups, let alone between SSCEP and non-SSCEP schools.

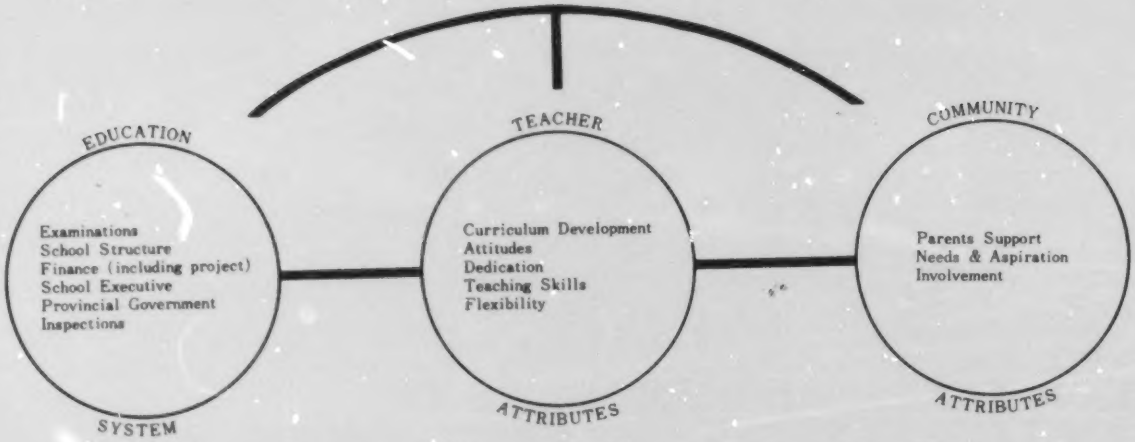
Problem Area 3: Programmes

In order to complete the curriculum development process called for in SSCEP and thus give continuity and durability to the programme in each school, the yearly SSCEP programme and all project programmes must be detailed in written form. Without these, the school and project programmes will continue to be reinvented at least partially each year, particularly in years when staff turnover is high. The written and revision process is severely handicapped when written programmes are not available. The schools vary in the number of their written programmes but no school has a full set of these programmes.

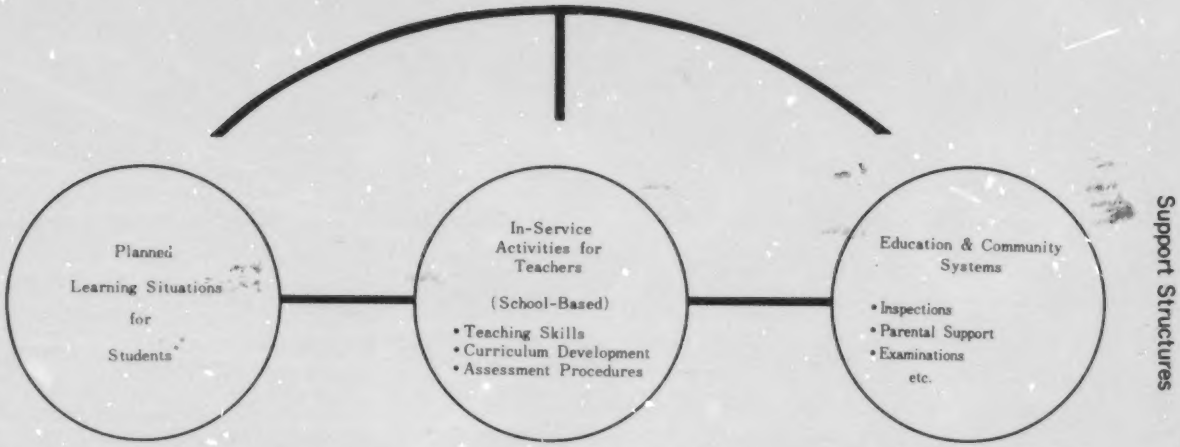
EVALUATION

Funded under Education II, the Educational Research Unit of the University

Operational Constraints: The Project's Dilemma



Since curriculum change guarantees diffusion and adoption, planning must take place at both the society and interpersonal level. SSCEP, which can be referred to as a project in curriculum change, has encountered operational constraints with varying degrees. Some of these can be classified in the following way : (i) the teachers personal needs for satisfaction and professional esteem, (ii) the traditional sanctions of examinations and regulations prevalent today, (iii) the inspectorial and promotion system, (iv) the inadequacy of pre-service and in-service teacher education, (v) the type of leadership provided by the school, (vi) the time needed for discussions, in-service, and planning of programmes, and (vii) the community's needs and aspiration toward education.



Currin (1981) identified two support structures for the effective operationalization of the SSCEP learning model : (i) that learning experiences for students need to be planned well, in detail, and preferably in advance, and (ii) that while this is necessary, teachers need to be well-versed in a wide repertoire of teaching skills, curriculum development, and be able to assess student learning outcomes. The latter, Currin argues, needs to be carried out through a (school-based) in-service programme (Currin, PP3-2-2/81/593). Until recently, Bowling (1982) has added a third support structure. The system (which is prone to maintain its traditional status quo) needs to be flexible to allow educational change to be trialled in the project.

of Papua New Guinea is currently engaged in a two-year evaluation programme (1982-83) which is intended to determine the limits and possibilities of operating SSCEP on a wider scale.

In this connection three main questions may be considered:

a) How is the evaluation organized?
b) What do we know? and
c) What more is needed?
d) The Evaluation is organized under nine sub-projects:
   - Review of Research (1978-81)
   - Academic Standards
   - Attitudes of Teachers, Students, and Community
   - Operational Problems
   - Effects on Teachers
   - Graduate Follow-up
   - Non-SSCEP Examples
   - Student Learning
   - Final Report

CONCLUSION

The identification of the problems encountered in the SSCEP learning model (and indeed in any educational innovation design) ought to illuminate support structures or corrective measures necessary for the effective operationalization of a learning programme aiming to identify alternative approaches toward improving the quality of education.

The key feature in the success of the curriculum change seems to be the support teachers will need as they leave the security of the traditional roles and adopt an experimental and open stance.

Given the complexities propounded in nature of an innovation design, what kind of teacher preparation is needed both in the area of pre-service and in-service teacher education? What kind of further support is needed from the innovation designers? And what kinds of strategies need to be employed to create an understanding for the inspectorate to foster such change?

The establishment of curriculum innovation is itself a source of continuous re-definition of roles. The changes that occur in the teacher's roles point to a number of important questions on the future policies for teacher education and utilization.

The teacher's role is seen as increasingly upgraded even with an education system relying heavily on technical aids. The teacher's role remain that of the manager of the learning environment. The renewed awareness of the school's responsibility to foster development of the young people demands a new level of preparation and performace from the teacher. The attitudes and behaviour of the teacher must continuously change to foster high student performance. Further, the

teachers will need a wide repertoire of teaching learning strategies and autonomy of decision over the creation of an adequate educational environment for the pupils to be able to discover their pathways.

DEVELOPMENT OF RESEARCH CONCERNING THE IMPLEMENTATION AND EVALUATION OF REFORMS ON EDUCATIONAL CONTENT AND METHODS

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The Philippine Educational System is entering a period of extreme alternatives. In this stage of development characterized by scientific and technological advancement an enormous tangle of issues seem to emerge due to more determined national goals, changing aspirations and emerging values of individuals and the community at large. Such changes have brought about concommitant problems which have political, social and psychological implications. All these factors intertwine in challenging education to respond courageously to these changes by preparing all sectors for such needs that the country faces.

At this stage of national development, it is felt that the Philippine educational system must exert concerted effort to mobilize the academic community to pursue common goals in both public and private sectors as well as those from other agencies and sectors of the government, including industry and non-government entities. It seems that at this stage, it is no longer logically appropriate for the system to cope with all these changes by mere intuition, suppositions or extravagant whims and notions. Rather, a more systematic step in the right direction is both necessary and imperative. However, while the system may not be adequately prepared to cope with these formidable challenges and complexities in the immediate horizon, it is undoubtedly necessary to prepare for the future by undertaking reforms on the basis of empirical data. This is in recognition of the fact that the educational system is moving towards a direction where there should be minimal or no room for mistakes. As a group, we cannot afford to contribute further to the mounting problems and complexities that beset the system by being unsystematic and unmethodical in planning out reforms and innovations. Rather, it is envisioned that we should be able to exert influence or control the educational changes in the future.

This emerging concern is apparent in the following developments in the Philippine educational system:

First, baseline data on different levels and aspects of education are being generated in recognition of the need for a scientific basis for reforms or innovations which will be introduced in the system. Findings in these surveys serve to pinpoint areas which will need change or improvement.

Second, feasibility, applicability and acceptability of reforms envisioned are being pilot tested and evaluated accordingly before they are implemented on a

national scale. Experiences in the past have pointed to this need, and in view of competing demands on scarce resources, it is no longer desirable to introduce reforms which are not empirically based and validated as to feasibility and acceptability by the clients. So, when reforms are introduced, it is understood that these are already tested.

Third, every reform/innovation is evaluated, and on the basis of such evaluation, recommendations are made for or against the reform/innovations. Policies are then formulated regarding the innovations referred to.

These are indicators of a systematized direction in the introduction of reforms in Philippine education. It is hoped that this direction will pave the way for old problems to be viewed in a different light and thus new ways and new thinking about solutions to old problems will be explored, examined, studied, developed and implemented.

Flashback

The need for proper implementation and evaluation of reforms of educational content and methods has been a continuing concern of the Philippine educational system. Evidences of such concern are depicted in studies conducted in the past, all of these done in an effort to evaluate reforms of educational content and methods. Such studies vary in extent and coverage, but the most comprehensive ever to be executed was the one conducted in the primary level in 1975 known as the "Survey of Outcomes of Elementary Education" in the Philippines and more popularly referred to by its acronym SOUTELE. It was an attempt to empirically ascertain the nature and extent to which the system has succeeded or failed in its efforts to provide elementary education to the greatest number. Phase 1 of the study was concerned with the assessment of learning in the sixth grade while Phase 2 dealt with the measurement of learning outcomes in the fourth grade.

This study looked further into the inputs of the system which included the physical and human resources and in the process highlighted the outputs in terms of scholastic achievements and student attitudes.

Findings of this study revealed the following:

1. While the sixth grades consistently scored higher than the fifth graders in scholastic achievement tests, the differences in scores were not statistically significant.
2. The subject areas which the sixth grades across the nation seem to have achieved least are those which have traditionally been referred to as the three R's——Reading, Mathematics and Language.
3. An analysis of responses to attitudinal indicators shows that the pupil's experience of school is independent of their attitudes towards their teacher.

In the light of these findings recommendations related to or with implications

to content and methods were pesented. Such findings and recommendations served as springboard in exploring ways and means of introducing reforms for the improvement of content and methods in the elementary sector.

In response to these findings and recommendations, the Bureau of Elementary Education initiated the development of the Elementary Learning Continuum (ELC) which is a listing of skills and objectives to be undertaken by elementary grades pupils from kindergarten to sixth grade. At the end of each grade, key behaviour indicators (KBI) were identified to serve as a guide to teachers in the evaluation of performance of their pupils.

A twin measure undertaken by the Bureau of Elementary Educathon was the development of a curriculum that is responsive to the findings of SOUTELE and relevant to present day needs of pupils, 80% of whom come from low income families. The result of this effort was a programme known as the Experimental Elementary Education Programme (EEEP) launched in 1979-1981 on an experimental basis in 125 divisions throughout the country. Its main objective was to determine whether a curriculum with fewer subjects and shorter time for actual teaching and learning in the classroom will produce better results than the present school programme.

Findings of the study clearly revealed that there was a significant increase in mean scores from pre-test to the post-test in the three subject areas, namely: Communication Arts (English), Communication Arts (Pilipino) and Elementary Mathematics. Results also revealed that the experimental classes got consistently higher achievement results in all the subject areas tested from Grade II to VI. A factor which might have contributed to the higher achievement of the experimental groups was the decongested curriculum and the provision of adequate instructional materials in the form of textbooks for pupils and accompanying instructional guides in the new subject areas in Grades I and II.

Findings further revealed that teachers and school officials believe that adequacy of instructional materials could help improve achievement levels. However, this must be accompanied by appropriate teaching strategies.

Such a systematic attempt stimulated a study involving a sectoral analysis of elementary education. This was conducted in 1979 and results brought out the need for every citizen to be provided with at least an elementary education as a government effort towards achieving productivity and employment objectives. It also underscored the necessity for basic education which should be measurable both in quality and coverage. However, attempts to measure both showed inefficiencies which were reflected in the low student performance on standard achievement tests and similarly low participation and survival rates for the first elementary cycle of education.

Thus, in order that better support to development strategy may be attained, improvements in the quality of basic education were sought. In view of this,

programmes addressed to these problems have been launched. Some of these include textbook production, a programme for equitable allocation and distribution of school facilities, tryout of a New Elementary School Curriculum and Survey of Outcomes of Elementary Education, Technical Assistance and Research. These are now embodied in a programme known as Programme for Decentralized Educational Development (PRODED) which is now being implemented with funding from the World Bank.

Focus : On Going Projects on Implementation and Evaluation of Reforms on Educational Content and Methods

Backdrop

The eighties may well be considered as a real breakthrough in the implementation and evaluation of reforms of educational content and methods in elementary education. At no time in the history of elementary education has there been an attempt to pursue in a comprehensive manner such evaluation of reforms of educational content and methods as it is now. This is so because as early as 1970, the government began to view basic education as a requirement in the achievement of productivity and employment objectives. Viewed in this light, basic education now became a vital tool of transferring literacy skills such as communication, which includes speaking, reading, writing and listening, and computation skills, to the entire population. Inspite of these thrusts certain gaps were observed because the introduction of the reforms were only on selected components, and other components were neglected. As a result, when the analysis of the elementary sector was done in 1979, disparities were noted between and among regions in student participation, achievement level and survival rates.

These findings were used as basis in the preparation of a development programme designed to redress disparities and to improve overall quality and efficiency in elementary education. The Government't sector programme known as Programme for Decentralized Educational Development (PRODED) was submitted to the World Bank for funding and was approved as a sector loan in the amount of $100 million, in May, 1981 but became effective only in November, 1981. This assistance will be for four years only (1982-85) out of a ten-year (1981-1990) investment programme. Programme components include (1) civil works, (2) staff development, (3) curriculum and instructional materials development, (4) facilities and equipment, (5) technical assistance, (6) evaluation and special studies/research. The programme has been launched. Implementation of the various components is now in full swing.

On Going Researches

In preparation for the evaluation of PRODED, and in order to achieve better

understanding of the factors responsible for the problems being addressed, three major interrelated research studies are now being conducted to form as an evaluative matrix for its impact on the elementary education system. In this context of enhancement of learner achievement and participation in reduction of disparities within and among regions, it is hoped that at the end of the researches, the Ministry of Education, Culture and Sports will have available:

- a systematic basis for evaluating various significant outcomes of PRODED;
- testing methodologies, instruments and techniques——systematic data for resource allocation, curriculum and materials development for further activities related to the objectives of PRODED.

The following are the on-going researches primarily addressed to the evaluation of educational content, techniques and methods:

1. *Household School Matching Survey(HSMS).* This study is a response to the findings revealed in the Survey of the Outcomes of Elementary Education (SOUTELE) conducted in 1975. The findings of the study revealed disparity in educational achievement among regions. This disparity was traced to causes outside the school system and to in-school factors mainly related to the availability of quality resources at school level.

This study is now being conducted to identify factors necessary for estimating the impact of the investment, to identify the effect of out-of-school or household level characteristics of the environment of the learner upon the purposes of the investment so that the effect of the investment may be recognized. It is hoped that the study may be able to develop a model of the process whereby schooling, household and community interact as factors in the learning process and eventually factors which affect learner achievement will hopefully surface. It also hopes to isolate the independent effects of schooling inputs upon achievement level. With relevant baseline data, a picture of the current levels of performance and the extent to which schooling and non-schooling factors explain achievement, may be developed. In short, the baseline data will provide direction in the analysis of the impact of PRODED on the elementary school system.

2. *SOUTELE III*. This study is designed to measure outcomes such as student achievement, knowledge, competencies, aptitude for future learning, values, personality, interpersonal relations and other behaviours that are likely to be influenced by the programme. In brief, the impact of the programme expressed in terms of the achievement levels of the learner will be measured by this research study. In the context of PRODED, students are to be assessed at the same time they enter the programme in 1982 and again at some subsequent point in time in 1985 following exposure to the programme. The principal goal here is to assess the impact of PRODED in terms of changes in the student that are shown by comparing his input and output performances.

3. *The New Elementary School Curriculum (NESC).* PRODED necessitated a new elementary school curriculum which is responsive to the demands of the national goals, and to the functions of elementary education as identified by a Delphi study conducted for the purpose. This study identified the provision of basic education as the main function of elementary education and focused on the development of a sense of nationhood or Filipinism and a sense of humanism as values which should start being developed in the elementary grades.

This Grade I curriculum is being tried out this school year 1982-1983. The try-out of the other Grades will be done in a staggerd manner, with Grade II to be tried out in 1983, Grade III in 1984, and so forth. Implementation however will start in 1983 of Grade I curriculum, Grade II in 1984, Grade III in 1985 and so on. The process of try-out, validation, revision and implementation and evaluation of the materials will be observed. Meanwhile, data gathering on the content and methods will be a continuous process. All these studies plus the supervision-monitoring-evaluation (SME) mechanism of PRODED are expected to provide the research data on the implementation and evaluation of reforms on educational content and method in elementary education.

Research Agenda: A Proposal

If one were to extrapolate using what have already been undertaken in the past as anchor points while using the studies which are being conducted in PRODED and the global scenario as focal points, it would seem that the research directions are quite visible and clear.

The research agenda to be responsive to the needs of the times include specific researches on:

- Curriculum Development
  - Self-learning materials
  - Secondary curriculum
  - Teacher education curriculum redirection
  - Curriculum for the gifted and the disadvantaged
- Learning Oriented Studies
  - Learning for cultural identity
  - Approaches to nationhood/Filipinism approaches to reduction of human gap or humanism
  - Indigeneous learning styles of Filipino learners
  - Learning process gap between challenges and effort
  - Dynamics of the teaching-learning situations
- In-depth Studies on the Household School and Community Factors affecting Learning Achievement
- Teacher Development Studies
  - Curriculum redirection for pre-service of teachers for disadvantaged

groups
- In-service education activities
- Continuing education with the use of technology
- Non-traditional approaches to teacher development
- Teacher performance and factors affecting it

Evaluation Studies
- Self evaluation
- Accreditation equivalency tests and placement
- School and non-school factors affecting learning achievement
- Evaluation instruments of the affective domain

Epilogue

The progress being undertaken now in elementary education in the Philippines are clear indicators of a bright future. There are many positive trends visible in the horizon that reflects this scenario.

The growing concern now being taken with great seriousness are evidences that all sectors of government are searching for solutions to global issues which before were a concern of only a few. Now it is no longer an isolated issue. Rather, they seem to unite all sectors towards a common goal: improvement of content and methods in education.

The new complexities have increased the role of experts, of scientific wizards and of specialized research studies. These are considered necessary. However, this is no longer a monopoly of experts, but gradually, participation of all is becoming evident. It is felt that undertaking of this nature may well be the real workshop of new ideas. Researches may well be the springboard for this action. The key demand is not only to generate ideas, but to propel one to action. It is earnestly hoped that continuous effort will keep the search for better content and clear methods. It is best to keep this search open. Research should be given priority attention in education.

THE ELEMENTARY-MIDDLE SCHOOL DEVELOPMENT PROJECT: AN EDUCATIONAL RESEARCH FOR EDUCATIONAL REFORM IN KOREA

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Republic of Korea

I. Background

The devastation caused by the Korean War in 1950 and the almost disruption of the educational process during the period placed the development of a new educational system which is relevant to Korea's needs, a national priority of the highest order. Extensive and intensive efforts were made in the years following the war to build new schools, to create new teacher training institutions, to prepare new and additional teachers with higher qualification, and to develop new textbooks and other teaching-learning materials.

Due to the effect of compulsory education at the elementary school level, by the end of 1960's, more than 95 per cent of all children of elementary school age were enrolled and were attending schools. Enrollments at the middle and high school levels increased to the point that large number of children wishing to go beyond the elementary school were unable to do so because of unavailability of sufficient places. At the university level, a similar critical situtaion was observed with many thousands of qualified applicants unable to gain admission simply because facilities and resources were insufficient to meet the demand and the need.

While the period of educational expansion and development was occurring, Korea's economic and industrial development was skyrocketing. It has been generally recognized that Korea was rapidly achieving a new and important status in the world of business and industry. However, with this change came the need for improved education and increased educational opportunity in order to meet the requirements of a new and effective work force. Leaders in government and education clearly saw the need for educational reform that would enhance the process of national development.

II. The Establishment of a New Research Institute for Educational Reform

A Long-range Educational Planning Committee, appointed by the government to study educational needs and to make appropriate recommendations for the improvement of education, urged the undertaking of a commprehensive educational reform and at the same time suggested the creation of a national research and development institute to deal with educational reform projects and programmes. At

the request of the Korean government, a study team from the Florida State University conducted a systems analysis on Korean education and subsequently recommended the development of a new educational system for the primary and middle schools of the nation. This recommendation was followed by the granting of a development loan from the United States Agency for International Development for the establishment of the new research and development institute which was to undertake the task of developing the new education system, field testing the system through a programme of experimentation and demonstration, and diffusing the system throughout Korea.

On 31 July 1972, the Minister of Education formally approved the inauguration of the Korean Educational Development Institute (KEDI). The establishment of KEDI signified, first of all, the recognition of the importance of roles to be played by the educational research institute in implementing a new educational reform. Before the establishment of KEDI, it is not too much to say that the educational researchers were mainly utilized to defend and rationalize educational policies.

The Elementary-Middle School Development (E-M) Projcet has been the major task of KEDI since KEDI's establishment in 1972. Since the Elementary-Middle School Development Project can be seen as a typical example of the close interplay of educational research and educational reform, this will be described in detail as a major content of this paper.

III. The Elementary-Middle School Development Project

A. Goals and Objectives

In November 1971, the Ministry of Education authorized the KEDI to develop a plan for the Elementary-Middle School Development Project. The specific goals and objectives of the E-M project can be summarized as follows:

1. To develop a new curriculum that better reflects: a) Korean national ideals and needs; b) a balance in terms of cognitive, moral and affective learning outcomes; and c) modern knowledge and technological development and applications.
2. To raise the achievement level of children in the higher learning thought processes.
3. To raise the current achievement level of all children.
4. To reduce the regional gaps in achievement by equalizing the educational opportunities of both urban and rural children.
5. To provide educational opportunities for more children, especially in the middle school years.
6. To improve the cost effectiveness of the educational system.
7. To improve the accountability and credibility of the educational system to the general public in order to obtain more support for the new educational system.

These goals have become the "out-put goals" of the E-M project and the bases for the instructional designs and evaluation of the project.

B. Implementation Plan

The overriding goal of the E-M Project is to develop, test, revise and implement a relevant, modern educational system for the elementary and middle schools of Korea. The general implementation plan to accomplish the set of goals consisted of the following components:

1. Analysis and evaluation of current curricula and instructional practices.
2. Design and development of new curricular and instructional system.
3. Development and construction of adequate measurement devices.
4. Development of instructional programmes, materials, and aids.
5. Validation of learning programmes and new instructional system.
6. Training for the teachers, administrators, research and development personnel.
7. Development and installation of ITV system.
8. Production of developed ITV and other programmed materials and aids.
9. Public relations work and preparation for the nationwide implementation.

The intent of the plan was to focus on a total reconceptualization and restructuring of the existing system, not a series of patchwork and discontinued activities. It was generally recognized that the present Korean educational system, especially at the elementary and middle school levels, is characterized by an inefficient instructional process, outdated school curriculum with an overriding emphasis being placed on rote memorization of classically academic subjects.

C. The Development of the E-M Project

One of the first tasks of KEDI was to examine the current curriculum goals for each of the subject areas taught by elementary and middle schools and to develop the specific objectives for each grade level for each curriculum. To accomplish this, nine teams representing each 9 subject areas were established within the E-M Project with each team being composed of a subject matter scholar (usually a part-time research associate with an academic appointment at one of the colleges or universities), a senior researcher (usually a content specialist with 0-10 years of teaching experience and possessing some management skills), and several content writers (again persons with some teaching experience and an interest in development). These teams with the assistance of a few scholars employed as consultants analyzed each curriculum and the textbooks approved by the Ministry of Education. As a result of this analysis, course syllabi and lists of curriculum objectives for each content area by grade level have been identified for incorporation into later revisions.

In order to develop appropriate learning materials to meet the needs of

children and teachers, KEDI has also developed a general instructional system model similar to other instructional system models found throughout the world. The KEDI instructional model which is designed to take into consideration the academic progress of individual students but does not overload the teacher with management problems has five stages: (i) planning, (ii) diagnosis, (iii) teaching-learning, (iv) extended learning, and (v) evaluation. Based on the general instructional model thus developed, KEDI has also developed nine specific instructional models which prescribe the teaching-learning strategies for each of the content areas. These nine sub-models differ in format.

Because the new instructional system requires a variety of instructional procedures, within a particular classroom and, in case of ITV use across several classrooms, it has been necessary for KEDI to design a school management system to facilitate these changes. According to the new instructional system, KEDI has also developed instructional materials such as student workbooks, teacher guides, television programmes, radio programmes and evaluation instruments.

Since it is important to undertake teacher training in order to implement the new instructional system effectively, KEDI developed teacher training programmes to be used by the E-M Project staff for training teachers both for the small scale and the comprehensive tryouts. These materials include a teacher training textbook or manual, a slide presentation specifying the purpose of KEDI and the E-M Project, the instructional system, the school management system, the teaching-learning materials, the sub-models for the nine subject areas, two television programmes for teacher training procedures and a newsletter (Field Research).

In order to prepare for and carry out the massive planned change for educational reform, KEDI also had to undertake a wide variety of researches as well as the material development activities. Some of the typical researches done for the implementation were studies of educational goals and curriculum, explorations in the goals of Korean education, and studies of current educational strategies.

D. Field Testing and Outcomes

A significant aspect of the development plan for the E-M project is the plan by KEDI for small scale tryouts and large scale demonstrations of the new educational system. These tryouts were designed to test and verify the effectiveness of the total system as well as that of each of the components of system. The four small scale tryouts involved either a single grade or, at most, two grades, for a limited period of time. The emphasis during the small scale tryouts was to test the feasibility of the teacher guides, student workbooks, programmed materials, instructional TV and radio programmes, student assessment instruments, and to a limited degree the school management system and the evaluation design.

The four large scale or comprehnesive demonstrations were also designed to test the effectiveness of the programme in a large number of schools which included

16 representative schools throughout the counntry. This sampling of schools were drawn from schools representing large cities, smaller cities, and rural communities. In addition to continuing the test, the feasibility of the new instructional system, and the supporting materials, the comprehensive demonstrations would serve as a test for the teacher training procedures and the total school management system. Data from these demonstrations were utilized as part of the data needed for "the pay- off evaluation plan" for the E-M Project.

E. External Evaluation on the E-M Project

In May 1978, the Korean government appointed a National Commission to conduct a comprehensive evaluation of the Elementary-Middle School Development Project and the new educational system proposed. The tasks assigned to the Commission were: (i) to review the effects and outcomes of the new educational system as implemented in the E-M Project; and (ii) to provide the Ministry of Education with the basic data required for decisions relative to the national implementation of the new educational system.

The members of this Commission includuded the following individuals: eight professors from higher education institutions, six officers from the Ministry of Education, five school principals, three directors of educational research institutes of regional boards of education, and six researchers from KEDI.

The areas on which the evaluation studies were focused included: (i) the new educational system model (instructional system and school management system); (ii) insructional materials; and (iii) effects and outcomes of the new system as reflected in the demonstration and co-operating schools. The period of the evaluation study covered five months, May through September 1978. Eighteen demonstration schools were directly involved in the study.

At the conclusion of the study, the Commission made the following recommendations:

1. The new educational system developed by KEDI should be implemented nationwide on a gradual basis following a carefully planned time schedule.
2. The Elementary-Middle School Project should become an integral part of the long term educational plan for educational reform by the Ministry of Education.
3. The Ministry of Education should have the responsibility for the implementation and diffusion of the new educational system and KEDI should assume the task of follow-up studies aimed at revision and improvement.
4. KEDI should develop effective programmes for pre-service and in-service training of teachers relative to the new educational system and to the improvement of teaching in general. These programmes should be reflected in the curricula of teacher training institutions.

5. The costs of nationwide implementation of the new educational system should be assumed by the national government. However, alternative methods of financing should be studied.
6. Improvements in the new educational system should include guidance programmes, programmes for slow learners, and school management guides.
7. The Ministry of Education should provide KEDI with appropriate administrative support for its added role in the national implementation of the new educational system.

F. National Implementation of the E-M Project

KEDI has developed a tentative plan for the national implementation of the Elementary-Middle School Development Project. The basic elements of the proposed plan include the following:

1. The implementation will occur on a gradual basis in the elementary schools of the nation probably over a period of several years.
2. First priority in the national implementation will be given to schools in remote and isolated areas of the nation, with other regions being added on a planned basis over a period of years.
3. Initially, KEDI teaching-learning materials will be used concurrently with the present textbooks until 1983 when new textbooks will be available.
4. The new elementary textbooks will incorporate present KEDI teaching-learning materials as integral part of the textbooks.
5. KEDI will develop and administer a training programme for resource persons who will act as in-service teacher trainers for teachers in the local areas prior to and during the implementation phase.
6. KEDI will develop pre-service training materials for the use of Teachers Colleges in the training of new teachers.

KEDI has been implementing the new educational system as a reform for Korean education according to the above plan at the national level since 1979.

RESEARCH ON THE IMPLEMENTATION AND EVALUATION OF REFORMS OF EDUCATIONAL CONTENT AND METHODS IN SINGAPORE

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Introduction

Typically, research in Singapore is characterized by the twin strategies of what might be termed as "policy-oriented pragmatism" and "enlightened opportunism". Thus, besides researches which provide empirically-based inputs to policy decision-making, less pressured, and possibly more rigorous, investigations are carried out by gearing research opportunities towards what seems at the time to be a crucial problem. While policy-oriented research is frequently ad hoc and subject to rather limited time constraints, policies are seldom made on the basis of research findings alone. "Research opportunities" could arise in many ways, such as, for example, participation in a postgraduate course which requires the conduct of supervised research, the availability of external funds in specified fields which prompt academics to make a bid for these funds, or the presence of an expert who is invited to undertake a Special Study in his/her area of specialization.

Although the terms of reference for preparing this paper stipulates that it should focus on major ongoing research projects, references to recently completed research will need to be made from time to time in order to highlight the current thrusts or shifts in direction that are occurring especially at the Institute of Education (IE), which has a two-fold function of conducting pre-service and in-service teacher education at all levels and promoting research in education.

Besides the Institute of Education (IE), several other organizations also conduct research. In particular, the Research and Testing Division (RTD) of the Ministry of Education (MOE) was established in June 1981 by amalgamating the Central Testing Section of the Educational Services Division and the Research and Monitoring Branch of the Planning and Review Division, and the SEAMEO Regional Language Centre (RELC), which conducts a variety of courses that require participants to undertake research projects as part of the requirements for the various awards.

Some Research Concerns of MOE

The bulk of MOE research has been conducted by RTD, whose major concern is with the conduct and monitoring of public examinations. Hence, besides monitoring the performance of pupils in various examinations, RTD analyses the

results in terms of certain policies. For example, arising from the recommendations of the Goh Report,[1] children are channelled into various streams after Primary 4 and Primary 6 in order to allow them to develop their different abilities at different paces, with possibilities of lateral transfers in the case of wrong streaming or late developers. Thus, RTD is looking systematically into not only streaming practices, but also lateral transfer patterns and attrition rates at different levels.

Another example of a policy-associated concern is that of bilingualism. Apart from monitoring performance in the first and second languages, several specific studies have been carried out to ascertain factors which are associated with language learning and performance. In one study,[2] for instance, the effect of peer pressure on language learning was investigated by a series of discussion sessions with a panel of popular pupils and pupil leaders who were identified by means of a sociometric test. It was evident from the study that pupils generally conformed to the language-speaking environment of the school.

In the primary schools, the weakest pupils are channelled to the monolingual stream, where they concentrate on one language only and generally have a lighter academic load spread over a longer period of time. Since, there are possible underachievers among them and early diagnosis of learning problems is essential. RTD has also been developing and validating special tests, such as the General Ability Test. In a cross-validation study of the General Ability Test[3], some case studies of children performed above the 75th percentile of this test but performed poorly in the school examination were carried out. The one overriding factor was low motivation which was related to such environmental situations as broken homes, competition for time and energy as a result of helping out in family business or livelihood, poor sibling examples, and living with relatives rather than parents.

RTD has also been concerned with conducting surveys of pupil practices which are likely to be related to pupils' academic performance. Examples of such research are the "Survey of Nutrition, Television Viewing and Sleeping Habits of School Children in Primary Schools" and the "Survey of Homework".

The other Divisions of MOE have been less intimately concerned with research per se, although many of their efforts at solving ongoing problems could be classified as "Action Research". For example, the Curriculum Development Institute of Singapore (CDIS) which is responsible for the development of instructional materials for a rapidly increasing number of curriculum subjects, is always involved with formative evaluation through tryout of these materials in pilot schools and inviting external consultants, usually from reputed institutions

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(1) Goh Keng Swee et al., *Report on the Ministry of Education*, 1978.
(2) Lim Tock Keng, *The Effect of Peer Pressure on Language Learning*, RTD, 1982.
(3) Tang Ee Chen and Sim Pheck Choo, *A Replicative Study of a General Ability Test on Primary 4 Pupils (Age 9-13 Years Old)*, RTD, 1981

overseas, to advise, inter alia, on the curriculum plans and instructional materials being developed by the respective project teams.

A slightly different, but noteworthy, project of CDIS involves the development of materials and methods for remedial teaching in three primary schools. While the project has a longitudinal perspective in following several cohorts of academically weak pupils over a period of 4-6 years, interim results have been impressive and encouraging and serve to illustrate that "when the teachers care enough, soon enough, even the weakest pupils can be helped to improve and to succeed in their studies progressively"[4].

Some Research Concerns of RELC

Bearing in mind that RELC is concerned basically with English Language in the countries which contribute SEAMEO, it is nevertheless most impressive that between 1968 and 1981, there have been 192 studies conducted in Singapore, mostly by participants enrolled in its various courses. The studies range from language testing and error analysis to problems of inter-language transfers and Singapore English.

It is obviously not feasible to summarize each of these studies. But, fortunately, RELC has published abstracts of these studies as well as those conducted by participants, lecturers and visiting scholars to RELC[5]. The research topics are probably dependent to a large extent upon the kind of expertise available among the staff, for certain topics appear more frequently during certain years than others. A particularly striking example is the occurrence of as many as 18 studies involving interaction analysis, all of which were conducted in 1981.

Some Research Concerns of IE

While past research efforts at IE have tended to be sporadic and lacking in follow-up actions, attempts have been made recently to consolidate efforts in ensuring that research is utility-oriented. Thus, the major thrusts of recent and ongoing research at IE tend to be along the following main directions:

a) Curriculum (Development and) Evaluation, including curriculum materials and methods for academically weak pupils.

b) Pre-service and In-service Teacher Education.

c) Promotion of Research and Dissemination of Research Findings.

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(4) Yeoh Oon Chye & Pauline Ong. *Remedial Mathematics Teaching by SPEMS (Special Project on English, Mathematics & Science)*, CDIS, 1982.

(5) *RELC Research in Language Education, 1968-1981*, SEAMEO Regional Language Centre, 1982.

An interesting partnership exists between IE and CDIS, for the materials developed by the latter are expected to be subjected to summative evaluation by IE. So far, materials and methods for the following 4 projects have been evaluated:-

a) CLIPS (Chinese Language Instructional Materials for Primary Schools).
b) SELP-B (Supplementary English Language Project for Special Assistance Plan Schools).
c) SCLP (Supplementary Chinese Language Programme).
d) CUE (Correct Use of English).

Other projects, such as Primary Science Project and Primary Mathematics Project, are currently being evaluated. While differences in specific instruments and types of data to be collected exist among the different projects, evaluation normally comprises the four components, namely,

a) Intrinsic evaluation of materials (and methods)
b) Classroom observations
c) Survey of teacher opinions
d) Survey of pupil reactions/performance.

An off shoot of the recommendations of a Report of the Committee to Review the Curriculum for Monolingual Classes[6] is perhaps more interesting and challenging. For the first time, IE would be involved not only in the summative evaluation of curriculum materials and their use in pre-service and in-service teacher education, but also in actually developing revised curriculum materials for monolingual classes, including materials for teacher education and pilot testing of all materials.

Unlike other curriculum projects, this one involves the development and evaluation of a variety of subjects for five years of primary schooling for pupils who are mostly slow learners. Thus, there will be an attempt to de-emphasize academic content and emphasis will be a functional or practical activities, including the introduction of pre-vocational orientation during the last two years. Several sub-studies are therefore being conceptualized to test different approaches.

Since streaming also takes place at the start of secondary schooling, similar problems of weak pupils exist. A pilot study is currently under way to examine the feasibility of adapting Benjamin Bloom's mastery learning (ML) model to the needs of pupils in secondary schools, in an attempt to find alternative ways of helping weaker pupils to reach prescribed levels of mastery in the basic subjects. Given the constraints in the local school setting (e.g. standards set by national examinations, large classes, and high teacher workload), it will be necessary to *adapt* the ML model to suit local conditions.

Two recent sets of studies seem to lend support that the mastery learning

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(6) Sim Wong Kooi et al. *Report of the Committee to Review the Curriculum for Monolingual Classes* 1982

strategy is perhaps appropriate. In the earlier study, Ho et al.[7], interviewed a sample of pupils whose performance in Englisn Language in the Primary School Leaving Examination (PSLE) was poor in comparison with their performance in other subjects. Their findings pointed clearly to the lack of home support in English language learning. A follow-up study[8] was accordingly carried out with a sample of pupils who performed well in English Language in the PSLE as well as in other subjects, and who were carefully matched with the earlier sample on selected home background characteristics.

The main findings of the follow-up study were that the second sample of children were highly motivated and studious, had an appetite for reading, had an elder brother or sister to turn to and recalled having had good teachers. In an introductory note[9], Sim related the findings to the 5 variables in John Carroll's "Model of Learning", namely, Aptitude, Motivation, Opportunity, Quality of Instruction and Ability to Understand Instruction. Leaving aside the first and last variables, he pointed out that the remaining 3 were crucial in that they are within the control of teachers.

IE has always been concerned with children with learing difficulties. The Reading Unit and Guidance Unit have had well over 300 cases referred to them. In a recent report on 40 of these cases[10] it is apparent that, even though not many children went on to secondary school, the attrition rate was relatively low and that an interdisciplinary approach involving psychologists, social workers and reading specialists is most effective.

That reading is recognized as the bugbear of children who experience learning difficulties is probably the reason why a number of studies on reading have been carried out at IE. Through classroom observations, semi-structured interviews with a sample of 108 children and various standardized tests, Ng[11] discovered that Singaporean children in lower primary classes were reading slightly below the British norms and, in some cases, they were merely "barking at print" in reading, not having been able to comprehend what they read. She then followed this study by developing an informal method of reading assessment using running records.[12]

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(7) Ho Wah Kam et al, *Case Studies of a Sample of Pupils whose Performance in English Language in the 1981 PSLE was Poor in Comparison with their Performance in Other Subjects*, 1982

(8) Ho Wah Kam et al, *A Follow-up Study of a Sample of Pupils who Performed Well in English Language in the 1981 PSLE*, 1982

(9) Sim Wong Kooi. Introductory Note to the above.

(10) Quah May Ling et al, *Interdisciplinary Approach in Helping School Pupils with Learning Problems*, IE Research Monograph 2, 1982.

(11) Ng Seok Moi, *The Status of Reading in Primary 1,2 & 3 in Singapore*, IE Occasional Paper No 5, 1980.

(12) Ng Seok Moi, *An Informal Method of Reading Assessment*, IE Occasional Paper No 6, 1980.

Staff at IE have also been involved with other curriculum projects. For example, a team led by Eng[13] has not only been involved with syllabus review in Moral Education, but it has conducted surveys of teachers' perceptions regarding two alternative moral education curricula. It is interesting that the less traditional approach (Being and Becoming), which uses values clarification predominantly and does not have textbooks for pupils, evokes either strongly positive or strongly negative responses among teachers, whereas the more traditional approach (Good Citizens) did not arouse strong feelings for or against it.

Until recently, research on teacher education had not been taken too seriously in terms of applicability of findings. Even the Survey on Teacher Education Objectives[14] tended to be treated as an academic exercise, notwithstanding the powerful implications for the curriculum in teacher education. For example, the first survey found a substantial commonality between IE lecturers and principals with regard to their expectations of the initial training programme for graduate teachers. The "core objectives" identified (e.g.motivating pupils and questioning) were those directly related to classroom teaching. A number of "supportive objectives" (e.g. setting and marking exercises and classroom supervision) were found enhance the core objectives directly, while some other objectives were regarded as "peripheral objectives" (e.g. drills and routine duties) in that they refer to what teachers might need only occasionally. Interestingly, use of AVA was included in the last category. If indeed this skill is accorded low priority, the current emphasis at IE as well as the schools in the greater use of AVA equipment needs to be re-examined, or else the priority of this objective revised.

The follow-up survey of the perceptions of Diploma in Education students has also produced results with important implications. For instance, in comparison with both lecturers and principals, the students ranked the following objectives higher:

a) Knowledge of the national examination system,

b) Skill in constructing and using tests for evaluating pupils' progress,

c) Confidence as a personal quality.

On the other hand, they ranked the following objectives lower by comparison with lecturers and principals:

a) Knowledge of philosophic-political basis of educational practice,

b) Skill in setting objectives for a lesson,

c) Conscientiousness as a personal quality.

The apparent mismatches in perceptions suggest the need for the meeting of

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(13) Eng Soo Peck et al. *Status Report of the Good Citizen and Being and Becoming Moral Programmes*, 1982.

(14) R W Mosbergen et al, *Survey on Teacher Education Objectives*, (a) The Views of Junior College/Secondary School Principals and IE Lecturers, 1980, (b) The Views of Full-Time Diploma in Education Students in IE, 1981

the minds to thrash out differences.

Recently, four different teams were formed in order to conduct research on some perennial problems which beset the practice of teacher education at IE. The four projects are entitled:

a) Additional/Alternative Selection Instruments (ASI)
b) Innovative Teaching Methods (ITM)
c) The Assessment of Teacher-Trainees: Its Validity, Reliablity and Usability (ATT)
d) Follow-up Studies of Former IE Students (FSS)

Current selection procedures depend very heavily upon academic achievement measures and an interview. In Project ASI, additional/alternative instruments like the MTAI, the 16PF, verbal ability scores, and test of open-mindedness would be tried out. However, various questions regarding teacher effectiveness would need to be answered first. When these are tentatively resolved the administration of the other instruments would have to be followed by comparing the various criteria with subsequent professional grades and possibly even school performance.

Staff at IE have been trying out various new or non-traditional pedagogical techniques in their various courses, such as the use of computer assisted instruction, field studies, different micro-teaching arrangements, and self-instructional modules. Project ITM is therefore seen as an attempt initially to document these pedagogical approaches, identifying their strengths and weaknesses, and deliberately trying out yet more innovative approaches and obtaining evaluative feedback.

IE's participation in the Innotech NTR (Non-traditional Role of Teacher Education) project has resulted in the development of 24 self-instructional modules, especially for teachers of slow learners. These modules are currently being subjected to evaluative substudies such as a teacher survey, a panel assessment and classroom observations.

It is hoped that, arising from these substudies, the better modules would be selected and revised so that besides being more relevant, they would also be more attractive and readable.

Different modes of assessment have been applied in the various courses at IE, but no attempt has been made to ascertain or improve their validity, reliablity and usability. Of particular concern has been the teaching practice assessment, where a number of variables, such as: (i) lecturer/supervisor; (ii) curriculm subject; (iii) level of class/pupils; (iv) topic taught; and (v) school resources/constraints, can affect the grade given by a particular lecturer to a particular teacher trainee on a particular occasion. Hence, Project ATT attempts to study how sources of inter-rater and intra-rater invalidity and unreliability can be reduced, such as by moderation workshops in which videotaped episodes are viewed, assessed and discussed.

A serious weakness of IE's pre-service programme is that its relevance is not gauged in terms of how the graduates perform later on in school and how relevant are different aspects of the courses. Project FSS would in the first instance attempt

to conduct follow-up studies of former students who graduated in the last 3 years, and also to carry out case studies of a small sample of these recent graduates. It is, of course, expected that perceptions during the first year of service are likely to be different from those in subsequent years.

Besides the foregoing projects on pre-service teacher education, a number of research projects are currently being planned to tie in with IE's involvement with in-service teacher education. In particular, a perennial problem in in-service education has been IE's inability to reach the masses of teachers who require specific courses in any partiicular year and to ensure that what the participants ——usually no more than 40 at a time——have learnt can be applied and perhaps shared with others. Hence, at present a search for a more imaginative, yet realistic, approach that the present practice is being made, such as in a current project involving the development of an infrastructure for capitalizing upon the multiplier effects.

Promotion of Research and Dissemination of Research Findings

Because of IE's close linkage with other agencies, such as the various Divisions of MOE and the schools, it is imperative that results of research are readily accessible to all parties concerned. Oftentimes, accessibility implies that the study is properly documented and couched in meaningful language. Hence, a major preoccupation at IE has been to try to present research reports to policy-makers and consumers alike in an interesting and readable fashion.

A recent effort in trying to share the findings of research with teachers, who understandably abhor technical jargon, was the publication of REACT (Research and Evaluation Abstracts for Classroom Teachers) through the use of simple language and cartoon. The information on the main findings and procedures of research are conveyed to teachers together with suggestive implications.

It is hoped that teachers would not only become more interested to find out about what research has to say regarding classroom practice, but also be sufficiently concerned to learn some of the techniques of conducting simple research studies. As part of a long-term strategy, some action research studies are being incorporated as part of the assignments for some pre-service courses. Perhaps in a not too distant future, teachers would be able to join MOE officers and IE lecturers in joint research projects on the implementation and evaluation of reforms of educational content and methods in Singapore.

EDUCATIONAL RESEARCH AND REFORM IN SRI LANKA

W. Stering Perera
Sri Lanka

Sri Lanka has had several reforms of curriculum and school structure during the past two decades. A major reform involving the entire school curriculum was begun in 1972 and carried through to 1977 together with a structure change from one of 5:3:2:2 to 5:4:2. Among the notable features of this curriculum reform were: (a) the introduction of a new primary curriculum based on an integrated thematic approach; (b) the introduction of a new common curriculum for all the grades 6 to 9, with the new subjects such as integrated science, social studies and pre -vocational studies. Up to that time only the better schools taught science and mathematics to grades 6-10 pupils selected to go to the Science stream. Science was taught as Physics, Chemistry and Biology; (c) the introduction of a reformed curriculm to grades 10 and 11 with a set of common core subjects including community-setting and activity-oriented project work. During the same time population education content was introduced into the grades 6 to 9 curriculum utilizing an infusion approach by enriching the content in science, social studies, language, mathematics and health-science subjects. The curriculum reforms were done by the Curriculum Development Centre which was strengthened for this purpose. A structure change to 6:5:2 was made in 1978 together with some change of content in grades 6 to 12.

Currently the Ministry of Education is engaged in the preliminary activities connected with the latest reforms proposed by the White Paper on Education in 1981. This is the most ambitious reform attempted in view of its scope: the entire education system from primary to tertiary stages, overhaul of the organizational set-up, improvement of the service conditions of the education personnel and their training, and reform of content and teaching methodology.

It will be observed that curriculum upgrading and reform has been attempted in a system which has a long way to go in the provision of equality of opportunity. Although Sri Lanka has made considerable headway during the last fifty years to increase the general literacy from 69% in 1953 to 86.5% in 1981 and in school enrolment from 1.4 million in 1950 to 3.4 million in 1982, the delivery system is far from adequate to satisfy the need for the provision of equality of opportunity. Therefore the attempts at reform have to be justified more in terms of improving the egalitarian aspect than in terms of content enrichment and methodological improvement. For example the introduction of a common curriculum for grades 6 -9 in 1972 meant that subjects such as science had to be taught in about 5,000 schools instead of in 700. This meant several fold increase in the number of teachers required. Therefore all the energies of the Curriculm Development Centre had to be

diverted to make the reforms effective in terms of coverage. Thus the innovations that were introduced like the use of a network of master teachers for the vastly expanded in-service training system with the required coverage needed to satisfy the more important egalitarian aspect.

An attempt was made by the Curriculum Development Centre to evaluate the progress of the reform of the content by setting up an Evaluation Unit. The emphasis of the evaluation exercise was on the aspects concerning the objectives. The major feedback regarding effectivity of the methodologies came from the in-service education activities because these are managed mainly by the Curriculum Development Centre and the responses are easily received. However, the research had some difficulties in gauging the pupil's response directly due to the over-whelming pressure of the coverage of the reforms.

When the Ministry organization was overhauled in 1980 the need for a separate branch for Research was recognized and an Educational Research and Planning Branch was set up. An activity which was initiated at the Curriculum Development Centre which was the management of the Field Studies Centres was brought under the wing of this new Branch as a research activity. A matter which was significant and of interest to the seminar is the new development, when the subject of the White Paper reforms was assigned to this same branch. As the branch instituted research activities such as the identification of threshold values in pupils and teachers, advanced level examination had to be undertaken. However when the preparation of the White Paper and its implementation had to be given priority, the Research Branch concerned itself mainly with the two research-oriented activities ——the Field Studies Centre Programme and the setting and monitoring of Pilot Clusters as pre-implementation aspects of the White Paper reforms. This branch has been renamed as the Policy Co-ordination Branch.

The proposals for reforms in education included in the White Paper consist of three distinct segments:

a) The School System;
b) The Universty System;
c) The Non-University Professional, Technical, Non-formal/Adult Education System. (This segment has been designated the 'Tertiary Education System').

The School System

i) *School structure*

The free span of schooling will be one of 11years as at present, with primary education of 5 years and secondary level of 6 years. The age of admission to school will remain 5, as at present. The grades 12 and 13 collegiate level span will replace the present G.C.E. (A.L) grades 11 and 12. A new examination at grade 8 has been introduced in order to provide certificate for the large numbers who leave school without completing the entire free access span of schooling. A parallel Vocational General Certificate of Education course will be available for those who wish to

leave the school system at grade 8.

ii) *School curriculum*

The curriculum in the primary grades will remain unchanged. Grades 6-8 and 9-11 curricula will be similar to those existing at present, the major change being the introduction of a subject called 'Life Skills' in place of the present technical subjects in grades 6 to 8. Technical subjects will continue to be taught in grades 9-11. At the collegiate level, pupils will be required to study only 3 subjects in place of the present 4. Out of these also, only two need to be from the particular stream such as Science. A compulsory core curriculum consisting of First Language, English, Cultural Heritage and Socio-economic Environment of Sri Lanka and Project Work, has been added.

iii) *School organization*

One of the major proposals in the White Paper is to reform the school organization. At present, about 9,500 schools are administered as separate units regardless of their size and state of development. Of the 9,500 government schools, about 600 have less than 50 pupils, while 1,300 have enrolments between 51 and 100. On the other hand, there are 78 schools having 2,000 or more pupils, and of these, several have pupil enrolments exceeding 4,000. Regarding provision of teachers and physical facilities, the disparities are very wide. Attempts at rationalizing the school system have not succeeded because of the intense competition that exists among schools to grab state and community resources for their individual development as independent entities regardless of the need for such resources. Under the reforms, it is proposed to group schools into clusters. Under this proposal the smallest unit, for the purpose of administration and planning the school system, will be a school cluster. A large school in the cluster will be designated as a core school. The head of the core school who will be called the Cluster Principal will be the chief executive of the cluster.

iv) *Examinations*

Centrally administered examinations have been reduced to the necessary minimum. Sufficient recognition will be given to continuous assessment throughout a child's school career, and measures are proposed to enable assessment of pupil performance based on long-term and continuous assessment.

Universities.

The major role of the universities as centres of learning and research has been recognized in order to foster better standards of learning at the universities. Post-graduate schools will be developed.

Tertiary Education

Most of the proposals which will lead to the setting up of new institutions come under this sector. In order to develop, guide, support and co-ordinate all non-university higher education and technical and vocational education, Tertiary Education Commission (T.E.C.) is proposed to be established. The T.E.C. will take under its wing professional education, technical education and non-formal and

adult education.

The need for national consensus as well as independent and long-term policies with regard to educational development is recognized, and a National Education Council, consisting of eminent and high level personnel appointed by the President, will be appointed to keep the policies of the various ministries and agencies under review, while seeking to rationalize and co-ordinate their duties in the context of employment and manpower needs. A special committee has been appointed to review urgently the salaries and other incentives for teachers and other educational personnel.

The School Cluster Pilot Project

In view of the lack of experience and undertaking in this kind of reform pilot work on school clusters was begun in September 1981. A few observational studies were made from February 1981 to June 1982 during the time the White Paper was being drafted. It was soon seen that clustering was much different from school mapping for which educational planners have been trained. Because the concept involved fundamental changes both organizational and interpersonal, vis-a-vis the traditional educational supervision staff, the pilot work was in itself a complex undertaking, needing a multipronged approach. By July 1982 the School Cluster Unit of the Policy Co-ordination Branch had 19 pilot clusters in operation

Some of the clusters have shown progress far beyond expectations taking into accout the constraints under which the programme is operating. The major factors which, at this stage, appear to correlate with success are :

i) The leadership of the cluster principal. However leadership qualities alone have not been enough. The attitude of the principal towards innovations and his belief in the far reaching benefits of the cluster scheme have been the major factors which have combined with the leadership qualities in promoting the success of the Pilot Programme.

ii) Close monitoring of the pilot projects by the Ministry Unit Staff.

iii) Committed leadership of the Regional Authorities.

The changes which have already taken place are:

i) Rationalizations with regard to small grade-wise pupil number units were done on the suggestions made by the committees of Principals. The Principals were able to perceive the need for such rationalization. This perception shift was one of the major plusses of clustering. Such a painless rationalization could not have been accomplished under the present scheme, where removal of the upper grades is perceived as a downgrading of the principal's status.

ii) More effective teacher utilization. Schools in Sri Lanka have a perennial teacher shortage problem. The problem is aggravated by the lack of rationalization of grades and streams. The clusters have solved part of the problem by rationalization. Informal teacher placements within the clusters according to priority needs have been made possible by

clustering.

iii) The requests for new buildings, renovations, water and toilet facilities furniture, etc. are now being done on the basis of the actual needs.

iv) The leadership as regards improvement of the educational programme of the member schools does not rest with the core school only. Various member schools undertake the development in terms of subject.

While the pilot stage will be expanded to include about 30 clusters during 1983, evaluative and action research activities will be undertaken. Already case studies have been made with regard to two of the clusters. Another notable feature is the operational and ongoing training of regional administraton which has been informally going on as the pilot work proceeds. Therefore, as regards this aspect of the reforms a pre-researched and evaluated information as well as experienced supervisory personnel will be available by the time implementation is effected.

Field Studies Centres Project

The Field Studies Centres Project managed by the Research Unit of the Policy Co-ordination Branch was begun in 1979 as a curriculum development activity. There are seven Field Studies Centres in operation now. This functions as an educational resource as well as a curriculum development centre by:

i) Provision of facilities for the study of the natural environment on a first-hand basis.

ii) Supplementing and complementing the teaching-learning units on and about environment by providing facilities such as:

1) Reference material
2) Field activity manuals
3) Preserved/living specimens
4) Herbarium data
5) Experimental kits
6) Audio visual material
7) Lecture/disussion opportunities, etc.

iii) Organization of study camps for students and teachers along with educators, research workers, scientists, experts, etc.

iv) Provision of opportunities for the youth to take a leadership role in the conservation of the natural environment and for its utilization as an educational resource.

The necessary features a Centre has are:

i) An interesting natural resource such as a forest, a lagoon or a river bank to provide the environmental base. The resource should be complex and big enough, to be challenging as well as to provide a continuing fertile source for a number of studies.

ii) A physical resource base with reasonably equipped science laboratories, and residential facilities.

iii) An organizational base which can bring together on a permanent basis

science teachers and professional scientists.

The Field Studies Centre Project is listed as a major innovative contribution to APEID by Sri Lanka. These Centres are also being utilized for pioneering work in exposing pupils to energy concerns and to emerging alternative energy uses such as the use of photo-voltaic calls for electrical energy generation, development of solar energy devices such as distillers and cookers. This work has been documented at a UNESCO/APEID sponsored national workshop on alternative energy uses. These Centres also function as science teacher in-service centres especially for the introduction of new content. The work done as studies at camps in these centres without being constrained by a specified syllabus, later became operationally tested syllabus material. Currently the Field Centre Programme has been awarded two contracts——(1) by UNESCO, Paris, for the development of a multimedia package for environmental education, (ii) by UNESCO, Bangkok, for the develoment of environmental aspects of the curriculum with a view to utilizing the Centres as a teaching-learning resource on a wider scale.

This Programme which is now handled as a research project, remains to be evaluated and documented. Nevertheless, it has been a sounding board for trying out new concepts even when they currently appear remote from the school syllabus. This is a feature which has to be preserved if the school curriculum is to continue to be enriched with new concepts and methodologies. The Field Centres can function as an advance guard at the van of the curriculum and content development enterprise. It is now seen in retrospect, that the neglect of research aspects by the Curriculum Development Centre is due to the necessary emphasis on implementation. On the other hand, the contribution of organizations far removed from the education scene has been negligible. Therefore it appears that an institutional arrangement which is operational yet not geared to immediate implementation imperatives, is necessary in conducting educational research for the introduction of new content. The Field Centre Programme provides such a mechanism.

EDUCATIONAL RESEARCH CONCERNING IMPLEMENTATION AND EVALUATION OF THE THAI NEW CURRICULA

Kowit Pravalpruk
Thailand

The implementation of the new Elementary School Curriculum and the new Lower Secondary School Curriculum in Thailand began in 1978 with a one grade per year incremental scheme led by two years of tryout. Three years later, in 1981 the new Upper Secondary School Curriculum followed in the same manner. The system of 6-3-3 years of schooling will be completed in 1983. At the very last year of the first cycle (May 1983 to March 1984) the Department of Curriculum and Instruction Development plans to conduct a comprehensive evaluation covering all aspects of curriculum development with the view of waking some improvement in the second cycle. This comprehensive evaluation project intends to be a summative evaluation of a six-year effort in addition to the yearly evaluation activities conducted by both the Curriculum Development Centre and the Office of Educational Research and Planning.

To serve the purpose of this particular workshop, some of the significant findings from these evaluative research will be subsequently reported. But, before the discussion goes into those research activities, it will be necessary to describe some important aspects of the new content and methods. Finally, two major research-development projects will be discussed to present efforts that are currently made.

New Content and Methods

One of the common reactions made by teachers and educators at the beginning of the promulgation of the new curriculum was that there was nothing new. It was just a reorganization of old content. However, these reactions are being replaced by the complaint by teachers that they do not know how to teach appropriately, and by parents' comment that they can not teach their children any longer.

It is fair to say that there are new emphases in the new curriculum. Moral education in terms of character development and career education in terms of work-oriented experience are given time and interest. Education is meant to bring about happiness and well-being rather than learning about facts and figures in the text. The elementary education aims at the following human qualities and learning outcomes;

a) basic knowledge and skills,
b) good member of community and nation,
c) desirable qualities, and

d) peaceful life.

Similarly, the secondary education aims at the development of self-identity in terms of ability, aptitude and interest. Moral conduct and occupational interest are desirable outcomes. It is very important to allow the youngsters to know themselves and choose their occupation according to their strengths.

For the new methods, the new curriculum tries to incorporate the Thai socialization process into educational practice. For more than 50 years our education has been strongly influenced by Western views. So, the new methods of education must be humanized rather than industrialized. The process of learning is more important than the fact and product of learning. It is the opinion of most of the leading educators that to inculcate patience, the learners must go through some emotional arousing experience. One can not acquire patience by just learning what patience is, how to be patient and why we have to be patient. It is the process of becoming that should be emphasized.

Formative Evaluation

In 1979, the Curriculum Development Centre and the Office of Educational Research and Planning conducted small scale evaluations simultaneously. While the Office of Educational Research and Planning was using a systematic investigation through questionnaire and class-room observation, the Curriculum Development Centre informally investigated using interview and documentary analysis. The studies allowed all personnel who were involved in curriculum development to take part at least in terms of expressing opinions. The outcomes of the two studies indicated that;

a) teachers were still teaching as they used to do (lecturing 75% of teaching time), and

b) teachers did not know how to teach moral education and career education. They teach only content not process.

Even though intensive training of the teachers had been held prior to the implementation, it seemed that the impact was nil. Hence, there was a need to change teachers' teaching behaviour so that the implementation could be successful.

The Department of Curriculum and Instruction Development felt this urgent need. Subsequently, two projects were created and later implemented in order to encourage the use of the new methods by the teachers. The first project was "A Study of Thai Morality" to find a new effective teaching method in moral education and the secound was "Leader School" to demonstrate what ought to be according to the new curricula. It was hoped that these two projects would influence teachers to improve their teaching behaviours.

A Study on Thai Morality

The attempt to promote moral education began in January 1980. The Department of Curriculum and Instruction Development organized a seminar on

problems and issues in moral education. Several issues were discussed. Observations and suggestions were recorded for later reference. Finally, it was agreed among all leading moral educators at this meeting that some basic moral values should be given more attention. They are:

a) Faith in the Absolute Truth
b) Scientific Approach to Solving Problem
c) Kindliness
d) Conscientiousness
e) Alertness
f) Honesty
g) Diligence, and
h) Feeling Shame and Guilty for Immoral Conducts.

After the seminar, a working group was formed to define in terms of moral conduct these eight basic values. It was decided that a research-development project to tackle ways and means of facilitating moral conduct should be formulated. Hence, the DCID appointed a research committee to make a Study on Thai Morality. The activities covered three major tasks:

a) development of measurement instrument,
b) establishment of norms, and
c) development of teaching models.

The experiment on teaching models began in June 1981 and continued up until August 1981. At this time two teaching models, behaviour modification and attitude facilitation, were under investigation. Subjects were students in third grade and seventh grade in randomly selected elmentary and secondary schools in Bangkok. Three criterion variables were used to compare the effectiveness of the teaching models with traditional classes. The three variables were moral development scale, teacher's rating and classroom observation. The findings indicated that these two teaching models were more effective than traditional teaching on all three criterion measures.

At the end of 1981, it was clear that some new teaching methods could be adopted. All necessary materials such as teacher's manual and learning modules were ready for use. The next problem was how to give these materials to teachers and have them used correctly. It was decided that regular training was not effective and should be used as the last alternative. The research committee, then, decided to use research as a means for dissemination of the previous findings.

The Offices of Regional Education in 13 regions were contacted in January 1982 to find out if they were willing to participate in a research project on moral education. Some minimal funds were provided but they were first requested to make their judgement on involvement. The training of teachers was conducted by the Department. Some technical assistance was arranged but taking care of the experiment was the responsibility of regional offices. Six regional offices participated in the programme and some 60 teachers were appropriately trained. At

the moment, the data are being analyzed.

Next year (1983-1984), all 13 regional offices will participate in the study. Some 130 teachers will be trained and the teaching models will expand to cover more approaches like values clarification and modeling. It is expected that the multimodel will be used by most of the existing teachers.

Leader School

This project was initiated in 1980 by the Curriculum Development Centre. The activities started with the setting up of some criteria for schools according to requirements of the new curriculum. Several officers were involved in the programme as evaluators. Workshops were held in various parts of the country to train selected evaluators. More than one thousand teachers, educators and educational officers were trained and, later on, they conducted an evaluation of schools to make judgements on whether or not they should be leaders in the implementation of the new curriculum. If an affirmative decision was made, the selected school was to have some more assistance from the DCID. These leader schools served as an example in some aspects of the implementation. Teachers from other schools nearby used these leader schools as a place to visit and learn from real examples. It is expected that by setting these leader schools the question about what the school should be like will be clearly answered.

School cluster is another organizational structure that has a very significant role in the leader school programme. Nowadays, there are 414 leader schools. The Department expects that the number will reach 1,800 schools in four years.

Conclusion

The success of the implementation of the new curricula, including new content and methods, depends upon the changing of teaching behaviour of all existing teachers. As long as the teachers still teach the way they used to, and not the way they ought to do, the desirable outcomes will not be achieved. Therefore, research efforts should be put to find an effective way to change the behaviour of existing teachers. In-service training programmes are ineffective and costly. Participation in on-going research-development programmes is another alternative that can bring about more durable changed behaviours.

Appendix III

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A PROPOSED EVALUATION FRAMEWORK FOR AN EDUCATIONAL PROGRAMME

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An evaluation framework is presented here in the hope that individual researchers and R & D centres in the region will make use of it in furthering their thinking on implementing and evaluating educational reforms.

A. The Basic Components for the Programme Evaluation

A logical first step in planning any evaluation framework is to outline the basic components that will be involved. The proposed framework for programme evaluation described here consists of the following basic seven components.

1. Programme purpose
2. Present level of achievement of the programme purpose (need assessment)
3. Programme goals
4. Programme rationale
5. Programme plan
6. Implementation of the programme plan
7. Summative evaluation (outcome)

These basic components provide the scope and the framework of the educational programme evaluation. It is assumed that the seven components can be used to identify those specific steps that must be of concern in educational programme evaluation. That is, the basic components will serve to identify the evaluation activities in a comprehensive outline of the process of evaluation and will indicate essential guidelines that should be performed in the evaluation process.

1. Programme Purpose

Any educational programme that is being evaluated exists to serve certain purposes. These purposes can change or can be modified from time to time, but these purposes should be available to provide overall direction for programme and activities and to provide ultimate criteria for judging the effectiveness of a programme. These purposes are sometimes described as a statement of the philosophy of the programme. They usually consist of broad and general statements of why the programme exists. However, once a statement of the programme purpose has been obtained and has been evaluated, this statement becomes the important set of criteria for evaluating later statements of goals or intended outcomes for the programme.

In using the purposes of a programme as basis for evaluation three major

questions are of concern:

1) Does a programme have a clearly stated set of basic programme purposes?
2) To whom are these purposes important?
3) Do these purposes give a direction toward the achievement of important outcomes that are not presently being achieved at a satisfactory level?

2. Present Level of Achievement of Programme Purposes

Any educational programme that is being evaluated is designed to be more effective in achieving its basic purposes than some possible alternatives. This suggests that the evidences should be obtained concerning which purposes are being achieved by the current programme and which are not and at what level or to what degree are the purposes currently being met. This is an effort to answer this question, "What important programme purposes are not being achieved effectively by our current programme?" (Lindvall, 1982, Chapter 2, p. 12). This ingredient may involve a careful assessment of the extent to which the programme purposes are presently being achieved.

In using the present level of achievement of programme purposes as a basis for evaluation three major questions are of concern:

1) Are the purposes, as expressed, appropriate in terms of the level of achievement of each purpose?
2) How well is the programme doing in achieving its programme purposes?
3) Do the purposes represent later statements of goals?

3. Programme Goals

Any educational programme that is being evaluated is designed to achieve certain outcomes. These desired outcomes are usually referred to as goals. The term goal adopted here can be defined as statements of the desired outcomes. The goals are the basic ingredients in educational programmes. A goal may be stated at several levels of generality or specificity. The distinction between purpose and goal is made by the level of generality of each kind of statement. Purposes are concerned with ultimate outcomes and are usually phrased in general terms. Goals are narrower and usually a specific type of purpose. As in the first ingredient, the purposes are typically broad statements describing the very general outcomes that a given programme is intended to produce. It is necessary, therefore, to translate each purpose into one or more statements of measurable (or at least describable) outcomes when we wish to determine how well a programme is doing in achieving its basic purposes. This more limited and specifie type of statement is referred to as a goal.

These goals provide the major criteria for determining the success of a programme. The programme goals come from the assessment of present level of achievement of the programme purposes. These goals are actually related to all steps of evaluation even though the goals appear as the third ingredient in the

proposed evaluation model.

In using the programme goals as a basis for evaluation four major questions are of concern:

1) Does a programme have a clearly stated set of programme goals?
2) Are the goals feasible to achieve and if so, over what period of time?
3) Do these goals clearly specify the programme purposes?
4) To whom are these goals important?

4. Programme Rationale

The programme rationale as one of basic ingredients of the proposed evaluation model "will represent a bringing together of what is known about the given area, what principles appear relevant, what programmes have been tried by others and what have been the results of such trials, and what research results have meaning for what is being proposed" (Lindvall, 1982, Chapter 6, p. 3). Consequently, the strength and weakness of the programme rationale could also be an important part of a total evaluation of a programme.

When the goals have been established it is necessary to consider a general plan or strategy which the proposed programme will use to achieve these goals. The rationale, representing a part of the planning of the programme, are the assumptions, the general plans, the general procedures or principles that will be incorporated into their instructional systems. The rationale will be based on judgement as to how the types of goals can best be achieved. A good rationale will have much in common with a carefully structured review of related research prepared in conjunction with a given research study. It will describe what has been learned through research and through evaluation studies. The rationale, the theoretical framework, are an important aspect of early evaluation for any educational programme.

In using the programme rationale as a basis for evaluation three major questions are of concern:

1) Does the rationale exist in a written form?
2) To what extent is the rationale consistent with relevant research findings?
3) Is the rationale consistent with the programme goals?

5. Programme Plan

When programme goals have been clarified and a general rationale explaining how they can best be achieved has been evaluated, the programme plan identifies the basic components of the programme goals and describes how the components will function together to provide an effective operating system. The principal reason for identifying the specification of a programme plan as a seperate step in the proposed evaluation model is to provide a definite point at which the thinking concerning the nature of the programme can be identified and examined in order to carry out effective summative evaluation.

The programme plan as an ingredient of the proposed evaluation model is

another imortant aspect for the evaluation. The evaluation of the programme plan provides assistance in determining whether or not the plan is worthy of implementation. One technique for evaluating the programme plan is to compare the proposed plan with a comprehensive listing of elements which might be appropriate for large scale curricular programme.

In using the programme plan as a basis for evaluation four major questions are of concern:

1) Is there information as to how the components work together as an integrated system?
2) Is the plan obviously directed toward the achievement of the specified programme goals?
3) Is the plan based on the rationale?
4) Is the plan complete?

6. Implementation

The evaluation of the implementation of the plan will be concerned with what is involved in the actual operation of the programme and with evaluation procedures that may be used in studying the implementation of everything that was planned. The programme actually implemented may differ from the one described in the formal plan.

Variations in the implementation efforts are a result of many different factors, such as: (1) lack of the enthusiastic participation of those who are to carry out the programme, (2) inadequate delivery system of materials needed for the programme, (3) not enough understanding about the programme itself, (4) insufficient in-service or pre-service training for all participants who are actually responsible for operating the programme, (5) lack of supervisory activities, (6) lack of personnel for operating the programme, and (7) inappropriate time schedule for operating the programme.

In using the programme implementation as a basis for evaluation, four major questions are of concern:

1) What components should contribute to the programme goals?
2) Is the instructional process, including time schedule, teacher and student function, etc., implemented as planned?
3) Are the management procedures implemented as planned?
4) Is each planned component fully implemented?

7. Summative Evaluation

The main aspect of summative ovaluation is determining and reporting the types of outcomes that the programme produces. This will include providing rather detailed information concerning the extent to which the programme achieves its intended goals. Since the intended goals were already formulated in 'the programme goal', the goals should be measured by using appropriate measures such

as tests, interviews, questionnaires, and observations. Another concern of summative evaluation is unanticipated outcomes. These are outcomes which are produced by the programme unintentionally. The summative evaluation will include detailed information concerning the extent to which the programme produces certain unanticipated results. In order to identify and report the unanticipated outcomes, the unanticipated outcomes should be collected and reported by using appropriate methods such as process observation and survey of participants opinion.

The summative evaluation is the most important ingredient of the proposed evaluation model because it will be used to judge the outcomes of the programme. That is, overall decision making about the programme is usually related to the results of the programme summative evaluation.

In using the summative evaluation as a basis for the proposed evaluation model two major questions are of concern:

1) To what extent is each programme goal achieved in terms of implementation level?
2) What unanticipated outcomes are produced in the programme implementation?

B. Illustrative Components

To clarify the proposed components, illustrations are drawn from E-M project of KEDI.

1. Programme Purpose

The programme purposes of EMP are obtained from "The Korean Elementary-Middle School Development: 1972-1977" and "USAID Loan Proposal".

1) The determination of educational ideals and objectives reflecting the cultural heritage, social reality, and future direction of the Korean society.
2) The reformulation and systematization of educational content to correspond with the established educational objectives.
3) The development and utilization of modern educational methods, facilities, and materials to achieve an effective and economically efficient programme of education.
4) The establishment of a comprehensive research and development agency to assist the Ministry of Education in formulating educational policy for the nation.

2. The Level of Achievement of the Programme Purposes

The level of achievement of the programme purposes are obtained from "USAID Loan Proposal", "Florida State University Study", and "The E-M

Project".[1]

1) Instructional processes in use were not efficient.
2) Instructional materials in use were inadequate.
3) Educational technology was not fully utilized.
4) The regional gap of educational equality was a very serious problem.
5) An outdated school curriculum with an overriding emphasis being placed on rote memorization of classically academic subjects.
6) Curriculum had not sufficiently emphasized on educational goals of both the national and individual needs.
7) Grouping methods of students and the pattern of instructional staffing had not been sufficiently considered for the purpose.
8) The educational programme had a very high cost-return ratio in terms of their contribution to manpower development.

3. Programme Goal

Based upon the programme purposes the programme goals are specified as follows:. These goals are obtained from "The EM Project"[2]and "Analytical Case Study of the KEDI".[3]

1) To develop a new curriculum that better reflects (a) Korean national ideals and needs, (b) a balance in terms of congnitive, moral and affective learning outcomes, and (c) modern knowledge and technological development and applications.
2) To raise the current achievement level of all children.
3) To raise the achievement level of children in the higher learning thought processes (as reflected in Bloom's taxonomy).
4) To reduce the regional gaps in achievement by equalizing the educational opportunities of both urban and rural children.
5) To reduce educational opportunities for more childen, especially in the middle school years.
6) To improve the cost effectiveness of the educational system. (Because of the complexity of cost effective evaluation, this concern was beyond the expectation of the proposed evaluation model.)
7) To improve the accountability and credibility of the educational system to the general public in order to obtain more support for the new educational system.

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(1) KEDI, Unpublished Mimeograph, 1978.
(2) Ditto.
(3) Paul H.Masoner and Frank H.Klassen (Ed.), Final Report, American Association of Colleges for Teacher Education, 1979.

4. Programme Rationale

The programme rationale is obtained from task force committee reports in which about 150 literature and research articles on instructional psychology are summarized. The rationale of EMP for instructional procedures, for example, can be listed as follows:

1) Learning is enhanced when the learner clearly recognizes the instructional goals.
2) Motivation for learning would be enhanced when the learner understands the value of the instructional goals.
3) Instructional goals would be easily accomplished when the learner understands the prerequisites of the learning tasks.
4) Learning can be individualized when the teacher uses a variety of materials in class.
5) Learning is enhanced when the learner actively participates in the teaching-learning process.
6) Learning is effective when frequent immediate feedback is given to the learner.
7) Transfer effects of learning are increased when the learner has more opportunities to practice the learning tasks.
8) Learning is enhanced when the learner recognizes the evaluation criteria before teacher instruction.

In addition to above rationale, more than 30 other rationales for the EMP are specified in the committee report.

5. Implementation

The level of achievement of implementation is almost ignored in the evaluation of EMP of KEDI. Only some aspects of implementation, not the level of implementation, are partially assessed. The evaluation of EMP implementation are identified from five reports of "Comprehensive Demonstration of the KEDI Educational System".

Since the proposed evaluation activities for implementation suggest four different activities for determining the extent to which the programme is actually being implemented, the main evaluation activities for the implementation level of EMP can be also described as four different aspects.

1) For determining the level of achievement of each characteristic of the programmme, the EMP used "Analysis of teacher's guide, student's workbook and testing materials", "Opinion survey of teacher and student", and "School visit observation". In addition to these measuring activities, however, the proposed evaluation activities suggest "Classroom observation for investigating student behaviour change" and "Experimental design for examining each characteristic".
2) For the comparison of the actual instructional procedures to the planned

instructional procedures, the EMP used some measuring methods such as "Analysis of student's workbook used". The EMP also compared the differences among 'demonstration school', 'cooperative school', and 'conventional school'. In addition to these activities, however, the proposed evaluation activities suggest "Teacher and student interview", "Classroom observation" and "Analysis of student's notebook". The proposed evaluation activities also suggest that the comparison should be based on the level of implementation of instructional procedure at any given school and classroom at any given time.

3) For the comparison of the actual management procedures to the planned management procedures, the EMP used "Opinion survey of teacher and administrator" and "Analysis of classroom management recordbook". The EMP evaluation team also visited provincial Board of Education and demonstration school to find the management procedure. In addition to these activities, however, the proposed evaluation activities suggest "Actual status survey of classroom organization, grouping, teacher staffing, teacher training". The proposed evaluation activities also suggest that all comparison should be based on level of implementation of management procedure.

4) For the comparison of the actual time data against the planned time schedule, the EMP has no evaluation activities. However, the proposed evaluation activities suggest to collect the information about "Actual learning time", "Actual testing and data collection time", "Actual instruction time", "Actual material delivery time", and "Actual teaching preparation time".

6. Summative Evaluation

The proposed evaluation model suggests that the summative evaluation should consider both the intended and the unaticipated outcomes. Especially, the proposed evaluation model suggests that evaluation results should be interpreted in terms of the level of the programme implementation.

However, the summative evaluation of the EMP only included the evaluation of intended outcomes.

C. Evaluation Tasks

For each of above mentioned seven basic components of programme evaluation, clusters of evaluation tasks are identified.

STEP 1: Determining the Programme Purposes

This step is basically to find the overall direction of the programme evaluation and to provide ultimate criteria for judging the effectiveness of the

programme. This step consists of six evaluation tasks:

1) Identifying the sources for the programme purposes.
2) Determining the actual presence of the purposes.
3) Listing the purposes when the sources include the purposes.
4) Gathering the purposes when the sources do not include the purposes.
5) Examining the purposes.
6) Determining the purposes.

STEP 2: Examining the Level of Achievement of the Programme Purposes

This step is basically to assist in the determination of the programme purposes and goals. It does mean that any evaluation procedures must recognize that the level of achievement of each purpose should ultimately be considered in relation to both programme purposes and programme goals. That is, if the current level of achievement of a given purpose is very low, then the proposed programme could make substantial improvement. This step consists of four evaluation tasks:

1) Identifying the types of evidence for investigating the present level of each purpose.
2) Collecting information about each purpose from given information.
3) Examining the information obtained.
4) Examining the programme purposes in terms of current level of achievement of that purposes.

STEP 3: Specifying the Programme Goals or Intended Outcomes

This step is basically to provide clearly formulated statements of intended outcomes which will be used at all later steps. This step consists of four evaluation tasks:

1) Identifying the programme goals based on the level of achievement of each purpose.
2) Clarifying the programme goals identified.
3) Examining the programme goals clarified.
4) Verifying the final goal statements with the programme developers and the implementors of the programme.

STEP 4: Determining the Appropriateness of Programme Rationale

This step is basically to identify the general rationale in order to provide some direction for the eventual programme plan. This step consists of four evaluation tasks

1) Identifying the rationale for the programme.
2) Collecting the information for assessing the rationale.
3) Examining the rationale.
4) Verifying the rationale with the programme developers and the implementors.

STEP 5: Examining the Programme Plan Against a Comprehensive Theoretical Programme Plan

The purpose of this step is to determine if all aspects of schooling which may be affected by the programme have been included in the programme plan. This step consists of four evaluation tasks:

1) Establishing the operational set of specifications of a comprehensive theoretical programme.
2) Identifying the basic components of the programme plan.
3) Comparing the programme plan to the comprehensive theoretical programme plan.
4) Examining the programme plan based on the results of Task 3.

STEP 6: Comparison of the Implementation Plan with the Actual Implementation of the Programme

This step is concerned with the comparison of the implementation plan with the programme as it is actually implemented. The proposed plan is a part of the plan as discussed in *STEP 5*. To complete the comparison there are five evaluation tasks:

1) Determining the implementation level of instructional procedure and process.
2) Determining the implementation level of management procedure and process.
3) Determining the implementation level of time schedule.
4) Determining the implementation level of other components with the exception of the above three major components.
5) Determining whether or not the deviations from the planned implementation could have an effect or the outcomes.

STEP 7: Determining the Achievement of Intended Outcomes and Unanticipated Outcomes

This last step is basically to determine the achievement of intended outcomes and unanticipated outcomes. This step consists of six evaluation tasks:

1) Identifying the information needed to support achievement of the intended outcomes.
2) Identifying and selecting necessary instruments when appropriate instruments are available.
3) Developing necessary instruments when appropriate instruments are not available.
4) Collecting the data of the intended outcomes.
5) Determining the unanticipated outcomes.
6) Determining the extent to which the outcomes are actually being achieved.

REFERENCES

Abt, W.P. & Magidson, J. *Performing School-Problems in Programme Implementation and Evaluation*, Bererly Hills, SAGE Publication, 1980.

Alkin, M.C. *Evaluation Theory Development, UCLA-CSE Evaluation Comment*, 1969, 2, 2-7.

Apple, M.W., Subkoviak, M.J. and Lufler, H.S., *Educational Evaluation: Analysis and Responsibility*, 1976.

Beauchamp, G.A., *Curriculum Theory*, (3rd ed.), Wilmett, Illinois, The KAGG Press, 1975.

Broich, G.D. & Jenelka, R.P., *Programs and Systems: An Evaluation Perspective*, New York, Academic Press, Inc., 1982.

Cronbach, L.J., *Designing Evaluation of Educational and Social Programs*, San Francisco, Jossey-Bass Inc., 1982.

Korean Educational Development Institute, *An Application of New Education Systems: the First Comprehensive Demonstration of the KEDI Educational System*, Seoul, Korea, 1976.

_____, *An Application of A New Educational Systems: the Second Comprehensive Demonstration of the KEDI Educational System*, Seoul, Korea, 1977.

_____, *An Application of A New Educational Systems: the Third Comprehensive Demonstration of the KEDI Educational System*, Seoul, Korea, 1978.

_____, *An Application of A New Educational Systems: the Fourth Comprehensive Domonstration of the KEDI Educational System*, Seoul, Korea, 1979.

_____, *An Application of A New Educational Systems: the Fifth Comprehensive Demonstration of the KEDI Educational System*, Seoul, Korea, 1980.

Lee, Y.D., *Researches in Curriculum Policy Making*, Review of Educational Research, Seoul, KEDI, 1971.

Lindvall, C.M., *Outline of the Development/Evaluation Process*, Book in Preparation, 1982.

Park, D.S., *Development of An Evaluation Model for Large Scale Instructional Systems*, Unpublished Ph. D. Dissertation, University, of Pittsburgh, 1982.

EDUCATIONAL RESEARCH FOR THE IMPLEMENTATION OF EDUCATIONAL REFORMS

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Educational reforms in the Asian region have been going on for the last two decades or more. They have been directed by the policies and executive apparatus of the governments of the countries in the region. The role of educational research, in this context, depends on the kind of reforms envisaged, the speed with which their implementation is desired and the size and complexity of the country's population as well as the existing structure and organization of the educational system.

Educational reform is a process of directed change in the educational system of a country and a change which affects the educational system as a whole. It aims at a transformation of the educational system, and hence it is guided by stated policies concerned with the aims and objectives of education at various levels and their translation at the institutional level involving teachers, curriculum, books and other instructional materials and aids, evaluation, supervision and inspection, administration and planning. Educational reform is embedded in the social, political, cultural and economic aspects of a country's life, and because it is so, it can be a revolutionary change, or a gradual process of social transformation.

It appears that whereas research which precedes reform is not focused on policy formulation as such, although, unintentionally, it may lead to policy changes or formulation of a new policy, research concerned with implementation of reform has to have a specific focus on policy. This is the reason why in most countries of the region, some sort of institutional arrangements for the direction of educational research activities, from same sources of power as are concerned with decision-making in the matter of policies and plans for reform, have developed over the last two decades. By and large, evaluation research has received much greater attention, because planners and administrators are typically more concerned with receiving immediate feedback on the progress of reform so as to monitor the process of reform and make it increasingly target oriented.

It appears that educational research for implementation of educational reforms is contingent upon the willingness of the various groups concerned with educational reform, like, for instance, the politicians, the bureaucrats, the planners, the teacher educators, teachers and above all the public to accept the idea of educational research as a tool to provide reliable and valid information for decision making.

In order to bring about changes in educational contents and methods, it is necessary to go through several phases. First, the aims and objectives of the policy

of educational reform have to be translated into more specific educational objectives for each stage of education so as to take into account the ages and developmental characteristics of children. In a country, like India, one has to take into account the heterogeneity of the population also. The draft statement of educational objectives should be discussed widely by curriculum specialists, teachers as well as administrators and representatives of various segments of the population, such as executives, industrialists, agriculturists, businessmen and so on with a view to developing a consensus. Once the final sequence of educational objectives is available, the curriculum plan has to be developed in outline form and then discussed. The outline would indicate the broad features of the educational contents, leaving it to the specialists to develop the details. Although, these steps are desirable, usually in implementation, there is great pressure on achieving target on time. Thus, for example the plan of implementation of reform, usually formulated centrally, mention specific year-wise targets, keeping in view the transformation visualized in the policy statement on educational reform within a limited period of time. In practice however the process of implementation follows a shorter circuit, and there is a jump from the formulation of objectives to the detailed contents. The role of a national level research organization in avoiding such short circuit is crucial.

In developing the detailed contents, there is a problem of organization and management. School subjects like physics, mathematics, chemistry, biology, botany, zoology, physiology, history, geography, first language, second language and so on, require specialized knowledge of a high order. But the knowledge has to be put across to children in certain age groups in an interesting and meaningful way, which requires the wisdom of the experienced teacher, the language expert, the psychologist and the expert in audio-visual techniques. In other words, content and method have to go together from the beginning, instead of method being considered separately after the content has been developed. But this requires organization of different kinds and levels of expertise so as to provide for meaningful and creative interaction leading to a product viz the instructional material. The development of detailed content can hardly be realistic unless the textbook and the method of instruction have been visualized clearly. This is a complex interactional process and takes time. But it is better to give time at this stage than spend time later on revising the texts.

The criticism is often made that children are over-loaded; there is too much of information; too many subjects have to be studied for examination; there are too many books to be read, and so on. This happens because, although the interaction mentioned above may be provided for, there is hardly any overall interaction across subjects and stages of education. Each subject is considered vertically for the successive school stages, without any consideration of the horizontal aspect of a curriculum, which is limited by the instructional hours, the examination system, the children's age groups, the teachers' competence and so on. The organization and

management of the horizontal as well as the vertical dimensions of a school curriculum requires a time-targetted plan of operations as well as an infrastructure like a curriculum development centre in the national level research organization.

In the final phase, the contents as embodied in the instructional materials, including textbooks, need to go into the school system, where the question of delivery of the curriculum is supreme and, therefore, the methods have to receive the utmost care and attention. This requires in-service education of teachers to increase thier competence, development of formative evaluation procedures, adaptation of methods to suit the variation in the needs of learners arising out of diversities and handicaps, etc. The implementation programme, thus, requires organization and management of training programmes for teachers at all stages, evaluators, school principals, educational administrators, etc. The role of a national level research organization again appears to be a crucial one in this respect, because otherwise the curriculum transaction in actual class rooms is likely to be very different from what was originally visualized.

In the matter of educational contents and methods, it is important for any reform to have a critical appraisal of the existing contents and methods. There may be studies and investigations of existing content and methods which contribute to the mounting criticism of the state of affairs in the field of education in a country, leading to educational reform policies and plans. History is one of the school subjects which usually receives the first attention in any reform of content in most of the countries of the region which became independent during the last three decades. A survey of the critical appraisal of the existing contents in history should contribute towards identification of errors, distortions, misrepresentations and lack of information. In some cases, as in India, the perspective of history of India needed a change, in addition to errors and deficiencies. In the case of science, Indian experience shows that a survey of the school syllabi and textbooks in the science subjects showed that considerable updating and reorganization of subject matter were necessary.

Research on contents presented in the school textbooks and other instructional materials has to be a developmental research also, because in the rapidly changing world of today, any one-time survey is not enough, it requires trying out of new contents and their placement and integration in the rest of the contents. Contents cannot be studied totally in isolation from methods and so developmental research is a complex activity of tryout of contents and methods, followed by adjustment on the basis of feedback from teachers and learners, followed by fresh tryout. This is true not only for science subjects, but also for other subjects like civics, political science, health and nutrition, environment, population, national integration, and so on. The recent concern over moral education shows that appropriate contents and methods have not yet been developed, and requires a good deal of developmental research.

The placement of concepts in the vertical dimension of curriculum requires

research to determine the age-appropriate stages of concept development. Piagetian studies are necessary in the social and cultural contexts of the countries in the region so that the learning tasks for the children are appropriate. Very often, in the absence of such research-based placement of concepts, one finds that the children tend to learn by rote. But there is a knotty question of the relationship of concept-learning with information storage and retrieval, of concept learning with skill learning, of concept learning with attitude formation, etc. In other words, the question of relative emphasis between the idea and the specific facts, the idea and the skill which depends on the idea, etc. very often is neglected in implementation of reforms in educational contents and methods. Thus, for example in mathematics, the emphasis that should be placed on learning set theory as against the skills of operations with numbers has been controversial. The question regarding the characteristics of knowledge based on discipline-orientation as against environment-orientation are discussed at times, but there is need to develop carefully planned educational research. Such research, however, may take time, because time itself is a variable. We need to know what the children can do here and now, but in a reform, it is more important for us to know what the children would be capable of doing a decade from now, or more. It is this time dimension of development, of maturation, of structuration in knowledge, and what is more in the development of competence and insight, which creates a problem for educational research to be of immediate use in implementation. It is, however, essential to have a machinery for accumulation of information about what the children acquire, with what speed and with what results, over the years in school so that in a new reform cycle one has the advantage of a data base.

Some problems of implementation of contents and methods arise out of the socio-economic and cultural handicaps in certain segments of the society, e.g. language learning, science and mathematics in the context of universalization of elementary education. Educational research with target groups to evaluate learning outcomes, identify deficiencies and weaknesses in the learners as well as in the methods of teaching have been of help in developing suitable remedial programmes. But more basic research on language learning in the countries of the region needs to be done, becauuse of the nature of languages in the region which are quite different from the English language in many important respects. One of main aims of educational reform in the region has been to develop instruction through the languages of the country, e.g. in India. Although the instruction is through the local languages, there is an imbalance in favour of those who learn through English medium, and the deficiencies are largely in the presentation of content and methods.

With the development of non-formal education and distance education, the challenge of suitable contents and methods has become important in recent years. The learner is no longer the school child, they are adolescents and adults in addition to children who are out of school. The instruction is no longer restricted to the

classroom, the media have entered the situation in a big way. Whereas the usual evaluation research of learning outcomes, or of management and organization is being done as in formal education, there is a need for other types of educational research. The entry of the media in the field of education has quickened the pace of educational reform, and the infrastructure in the country may not be adequate to meet the emerging challenges of adjustments and development of contents and methods with speed. The research in the field of education has been tradition-bound, which was noted by the NIER Seminar earlier, but it is now necessary to break new grounds, because new types of learning situations have developed with the new groups of learners emerging out of the processes of democratization ushered in by the social, political and economic transformation of the countries. It seems that research with rigorous experimental designs as well as with quasi-experimental designs should receive greater attention from the researchers in order to help in the implementation of the reforms, in addition to monitoring and evaluation research in which the administrators are typically more interested.

The role of historical, comparative and philosophical research for implementation cannot be underrated. But there has been very little of it because, somehow, the idea has gained ground that action research is the thing that is needed for the countries in the region in implementing educational reforms. But the countries in the region have a rich legacy of history and philosophy as part of its changing culture, and one always stands to gain even from hind-sights derived from history. Comparative studies of successes and failures of reforms should be of great use to the countries of the region concerned with the implementation of reforms in their respective countries. Philosophical issues always underlie the educational reforms and are related to political and economic issues as well. Such issues, when philosophically studied, should be of use particularly in contents and methods, because, otherwise there is a danger of creating contradictions and confusions in the minds of the people. The concern over values and over moral education seems to indicate there is an awareness of such contradictions and confusions, and hence the need for more and better light is reflected through the demand for education in appropriate values and morals. Admittedly, good philosophical, historical or comparative research is not everybody's cup of tea. But it is important for us to recognize their importance and encourage more of such research along with, and not at the cost of, other more rigorous types of educational research.

THE ROLE OF EDUCATIONAL RESEARCH IN THE IMPLEMENTATION AND EVALUATION OF INNOVATIVE METHODS OF TEACHING IN SCIENCE & MATHEMATICS

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Implementation and Evaluation

Research generally aims at adding to our knowledge an understanding of the world, or part of it. In education, however, implementation and evaluation are always designed, and paid for, with the intention of influencing decisions and processes. It may therefore be considered as a form of applied research.

Implementation requires strategies, plans and systems for the actual use of the products of educational technology in the broadest sense of the term. The employment of implementation means should preferably be scientifically buttressed by research results and theoretical foundations. In education, the production of teaching-learning materials is usually followed by evaluation and then improving them before implementation on a much wider scale. This stage of dissemination may usually mean the creation and publication of the teaching-learning materials so produced.

The use of evaluation for administrative purposes has usually concentrated on the middle range. Audio-visual devices have made it possible to train teachers in the use of instant feedback. Long-term effects are difficult to measure because of the multitude of intervening variables, although we may regard the biographical approach as perfectly scientific.

The main characteristic of evaluation which distinguishes it from basic research is its concern with values. The term 'evaluation' loses meaning unless explicit values have a central place in it. The processes of evaluation are based on the assumption, or demonstration, that what is observed and recorded manifests a degree of attainment of value-based objectives. It may appear that simple forms of evaluation are concerned only with effectiveness, as for instance, attempts to measure the effectiveness of a method of science and mathematics teaching.

Evalution of the various aspects of using innovative teaching methods should not stop with the completion of the trial phase of a project, as was done in the past with many new projects. Education agencies have realized that it should be a continuing basis throughout the various expanding phases of a project as more and more teachers and students are involved in the teaching-learning process. Problems are bound to surface and it is important to identify the ones specifically for decision-makers to make changes where necessary and for researchers to carry out further studies where appropriate.

Inovative Teaching Methods

Science and mathematics curriculum reforms for elementary and secondary levels have been greatly influenced by the learning theories of Piaget, Bruner, Dienes, Gagne, Skemp, etc. Activity methods, discovery approaches and inquiry learning as proposed by them have been prescribed by curriculum reformers for teaching science and mathematics since the seventies. The focus is on the learner rather than the teacher or the subject in order to assist him in developing an understanding of what he learns and to acquire the ability to apply concepts he has learnt to real situations. Ausubel in his theory of Cognitive Learning states that meaningful learning can only take place if new knowledge is linked to related concepts already in the child's cognitive structure. it seems however, that some evaluative studies have shown that discovery and inquiry approaches have not always seemed to develop meaningful learning. This is thus an area of concern for educational research to investigate (Ruberu, 1982).

Major Problems of Education

Major problems have also arisen in implementation of new instructional materials and innovative methods of teaching science and mathematics for all schools especially in the countries where education is centralized.

Centralized curriculum reforms mean the introduction of innovations from a source outside the classroom which is the domain of instructional operations of the teacher. Resistance to change in teaching styles is natural. However, teachers may have perceived the need for innovative teaching approaches but curriculum writers have not given clear and explicit interpretations of what teachers should look for and how they will do them in their day-to-day teaching. How far have science and mathematics teachers been given adequate orientation to the full understanding and implications of the use of innovative teaching methods as intended by the curriculum reformers is still a question (Chin, 1980).

Most curriculum writers have not specified the model(s) nor given any adaptations of any of these models of inquiry teaching required for innovative instructional programmes but have made assumptions that teachers, after undergoing short in-service training, ought to know what these innovations demanded of them.

A research project in one country reported that a survey on the cognitive abilities of selected biology teachers showed that only about 22% are able to do formal reasoning and a large percentage are at the transitional stage from late concrete to early formal operation level. This has serious implications because the development of logical thinking among students cannot be fully attained as long as a large percentage of their teachers have not fully developed their own formal or

logical thinking (Villavicencio and Tayko, 1981).

An evaluative study in another country showed that science teachers were not fully certain of how to teach science by inquiry, although most of them had received training in the use of the inquiry approach. This implies that in-service and pre-service training in inquiry teaching needs to be evaluated and reviewed (Chin, 1980).

The above case studies warrant similar research or evaluative studies of representative samples of teachers in various mathematics and science subjects by various education authorities, if these have not yet been implemented. For instance, a survey in a country indicated that 70% of its primary school teachers were still using teacher-centred methods of teaching new curriculum materials, thereby defeating the very aims and objectives of the new curriculum (Chin, 1980). In another, however, 70% of activities in some physics classes were teacher-centred and that some important aspects including design of experiments were almost never discussed (Chin, 1980).

These macro problems of implementation and evaluation of innovative methods of teaching are of serious concern to education administrators but they should not be considered in isolation from other areas of new curriculum implementation. Rather, they must be further researched on or evaluated in their relationship to content, time allocation for each school subject, school and classroom management, financing, instructional materials and equipment.

Curriculum writers might have pushed too far in their enthusiasm in prescribing every lesson as a practical/discovery/inquiry activity with the result that teahers cannot cope with the task of the preparation and management of every classroom activity. In addition, if time study of such activities in a school is taken into account, the time required for implementation will exceed the class time alloted for that subject.

Another factor which discourages teachers from using the learner-centred activity is the lack of prescribed teaching aids or materials from the central supply agency or the lack of funds to purchase materials or equipment for carrying out appropriate classroon activities. So proper implementation has to be postponed and this ultimately frustrates the teacher. To prevent this, it will be necessary for curriculum planners and reformers to ensure a systematic budgetary commitment of funds from the authorities for the various stages of implementation of new curricular reforms. They should realize that implementation of innovative curriculum projects is a very complex and costly national educational enterprise for a centralized education system following a standardized teaching-learning system. Inquiry/discovery learning for science and mathematics is no doubt very valuable, more effective and more permanent than rote learning but too much emphasis may deter learners, especially the less-abled ones from studying science and mathematics as such activities demand a lot of their time for mental work or thinking. No single teaching method can claim to have all the answers for learning a subject. The statement 'teaching is an art' is still true today in this age of science

and technology. Every teacher has to be equipped with a variety of innovative and traditional teaching methods in order to meet the diverse learning styles and individualistic capabilities of his learners.

In most countries where curriculum reformation is centralized, innovations in teaching methodology are concentrated on improving class and group teaching strategies including the careful employment of audio-vidual aids. Because of the large number of learners in a class, it is humanly impossible for a teacher to give more personal attention to individual students during class time which is taken up fully by activity work. But central to the attainment of quality education is the learner himself. The provision of self-learning at his own pace outside classroom hours such as individualized learning in the form of programmed instruction may be one of the missing links in our search for more meaningful learning as well as for more effective assimilation of knowledge. For real learning to take place, it must take into account the great human diversity in cultural background, styles of life, values, goals, motivation, level of mental ability, personality traits of the learners and their diverse learning habits and environmental factors, etc. In addition, for real learning to occur, the methodology employed must be rooted in a learning theory buttressed by scientific research results and tempered by effective implementation strategies.

Innovative Methods of Teaching in Science & Mathematics at the Matriculation Science unit, Universiti Sains Malaysia

In recent years, self-paced and individualized insturuction to facilitate learning at all levels of science and mathematics education and training has received increased emphasis. Bridging courses are part of a larger scale of individualized instruction. Longer term educational goals of an institution play a part in selecting an appropriate bridging and remedial strategy to overcome the problems faced especially by the Matriculation Science Programme of Universiti Sains Malaysia (U.S.M., the Science University of Malaysia). It must be expected that new technology, novel strategies and in-depth research will continue to shape the implementation and evaluation of innovative methods of teaching in science and mathematics, but bridging and remedial education which utilizes self-paced and individualized strategies must anticipate the early transfer of the student to the regular courses of the institution as effectively and smoothly as possible (Chuah and Chin, 1982).

In order to achieve teaching-learning effectiveness, Programmed Instruction (PI) is singled out as an innovative methodology for circumventing the above mentioned problems faced by the Matriculation Science Programme, U.S.M. This is attempted through the SPICES (Self-paced Programmed Individualized Computerized Education Strategy) scheme as a strategy and using CALIBRE (Computer Assisted Learning/Instruction Bridging Remedial Education) as a

methodology to be implemented in the AVACAI (Audio-Visual Aids Computer Assisted Instruction) laboratory situation with study carrels using different media, e.g. Programmed Texts (PT), Slide-Tapes (ST) and Computer Assisted Instruction/Learning (CAI/CAL). (Chuah, Chin and Myint, 1982).

While AVACAI concept can be applied to the theory component of the laboratory situation of the SPICES strategy and CALIBRE methodology, the SKILLS (Science Knowledge Interactive Laboratory Learning System) concept is the practical component of the laboratory situation of the same which will include the use of more interactive psychomotor skills with the back-up of Audio-Visual Aids and Computer Assisted Instruction/Learning, where simulations of the practical aspects of the laboratory learning situation of science knowledge will be systematically taught and learned.

Programmed Instruction (PI)

Programmed instruction is an educational technique popularly associated with the use of teaching machines, in which the material to be learned is organized and presented in a format permitting self-paced, individualized self-instruction and self-testing, and the learner learns with a minimum of formal instruction. PI therefore is most suitable as a bridging and remedial mode to overcome the problems in the Matriculation Science Programme of U.S.M.

Unlike some educational innovations, PI is rooted in a system, viz, the Learning-Reinforcement Theory. The basic law of this theory, Thorndike's Law of Effect states that:

"Responses followed by reinforcement increase in frequency."

The law dictates one critical function, essential for effective instruction, the response-reinforcement contingency. That is, there is a relationship between behaviour and its consequences. The instruction which casts the student in a spectator role, the receiver of a presentation, or, leaves the results of active participation to chance, ignores the Law of Effect, neglects the functional relation it specifies, and breaks the most fundamental law of learning. The traditional lecture system which forms the main STAPLE is an example——too often it is not working. Therefore, this is where SPICES comes in.

At the present time, however, the field is in a paradoxical state where a technology of instruction is being used more to study the psychology of learning than to study the psychology of teaching. Since PI is an active approach to teaching, it forces the development of theoretical notions about instruction, because instructional decisions must be built into every programme.

It opens up a fresh avenue for individualized learning in the secondary schools and the universities of developing countries that requires understanding and analysis of one's reading in order to give an immediate response. This interactive form of learning activates the reader's mind and leads to the acquisition of techniques of self-learning and decision-making, which are some of the main goals

of education. As a result of their cultural background, Asian students are generally shy and reticent and do not like to articulate their problems publicly for the benefit of themselves or pester their mentors for a real understanding of lectures they have attended. They prefer to find out on their own. This is not very fruitful as there are few reference books in their national languages and they are handicapped in consulting such materials written in English. This is where PI units/modules locally produced meet the immediate demands of indigenous materials for self-paced individualized learning.

PI does not stop at the theory part of science or mathematics teaching. With regard to the natural sciences (Biology, Chemistry and Physics), the practical laboratory component can be designed in the form of PI. Furthermore, PI does not only involve theoretical manipulation of ideas and facts but can be applied to psychomotor skills. This is where the concept of SKILLS comes in. PI does not exist in the form of reading-writing only. It can be developed using the audio-visual approach. Some lessons on Cellular Biology (Biology), Chemical Bonding (Chemistry), Trigonometry (Mathematics), Oscillations and Waves (Physics) are very suitable for this medium which requires a slide projector and an audio casette tape recorder. It consists of a series of coloured slides synchronized with a casette tape that gives the appropriate narration. As each slide is projected, the student looks at it and listens to the taped commentary. He then makes a written response in a CALIBRE work book and checks it with the answer in the next slide. Similarly, the interactive computer terminal can be exploited to provide another form of PI generally called CAI or CAL (Chuan and Chin, 1982).

Computer Assisted Instruction/Learning (CAI/CAL)

Important in this transition from the mass education of individuals to individual education of the masses are PI as a process and the use of computers as teaching machines.

The large storage, the calculating capacities and the fantastic operating speed of the computer suggest great potential for its use for individualized learning. CAI/CAL is basically a new form of PI using the computer to interact with the user instantly. It can give instructions to the learner, call for responses, feedback the result and modify his further learning accordingly. The computer can also be used to measure each student's attainment or scores, compare them with past performances and with those of his classmates and then advise teachers on what parts of the curriculum they should follow next.

A CAI system should not be a supplantation but rather a supplementation of instructional media used currently in the teaching-learning process of the institution (hence, the SPCIES concept).

Conclusion

Educational research in the area of implementation of innovative teaching methods in science and mathematics has to come to grips with real teaching-learning problems and should be pragmatic. It should be based on the specific problems and issues through systematized evaluation studies by each country for its own level of education. In-depth studies need to be carried out on a continuing basis in the search for an integrated and balanced teaching-learning process that can effectively contribute to the quality of education in this age of science and technology. There is no alternative but to intensify indigenous educational research in developing countries just as curriculum development has been carried out indigenously by them since more than two decades ago.

References

Chin, P.S., *Recent Trends and Issues in School Physics Education in South East Asia, Journal of Science and Mathematics Education in S.E. Asia (RECSAM),* Vol. III, No. 2, July, 1980.

Chuah, C.C. & Chin, P.S., *Philosophy & Structure of the Matriculation Science Curriculum in the Context of the CAI Mode of Instruction,* Paper presented at the 'National Conference on Computer Literacy, Education and Training: The Role of the Government, Academic Institutions and Industry', organized by the School of Mathematical Sciences and Industrial Research and Consultancy Service of U.S.M., Penang, Malaysia 18-20 November 1982.

Chuah, C.C., Chin, P.S. & Myint, S.K., *The Applicability of Microcomputers to Educational Development,* Paper presented at the 'Study Group Meeting on the Applicability of Advanced Technologies to Educational Development', organized by UNESCO and U.S.M., 20-24 September 1982.

Ruberu, J., *The Psychological Basis of Learning Mathematics, Journal of Science & Mathematics Education in S.E. Asia (RECSAM),* Vol. V, No. 1, July 1982

Villavicencio, R.R. & Tayko, P.R.M., *Strategies to Develop Logical Thinking Through Biology Teaching, Journal of Science & Mathematics Education in S. E. Asia (RECSAM),* Vol. IV, No. 2, July 1981

EDUCATIONAL RESEARCH AND DEVELOPMENT: THE INNOTECH EXPERIENCE

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In 1965, at a meeting of Ministers of Education sponsored by UNESCO, several Southeast Asian nations agreed on a philosophy of regional co-operation through education, science, and culture. They evolved a plan for their mutual welfare and the advancement of peace and prosperity in Southeast Asia. The result was SEAMEO, the Southeast Asian Ministers of Education Organization, founded on 30 November 1965 composed of eight countries: Indonesia, Malaysia, the Philippines, Singapore, Thailand, Kampuchea, Laos and Vietnam. The organization has also three associate member countries, namely, Australia, France, and New Zealand.

SEAMEO operates through a network of regional centers and projects. One of these centers is the Regional Center for Educational Innovation and Technology (INNOTECH), now based permanently in the Philippines. The main function of INNOTECH is to identify educational problems common to the Region and to assist the SEAMEO member countries in solving these problems by encouraging innovation, developing solution models, and exploring the use of educational technology whenever appropriate. In addressing these problems, INNOTECH in effect undertakes educational research and development.

INNOTECH's Educational Research and Development (R & D) Projects

Educational R and D, otherwise called research-based development, is considered by many as one of the promising approaches for improving education. As a developmental effort, it is problem-oriented, consciously designed to come up with solutions to educational problems. It is utilization-focused in that the educational product developed will have to be packaged for operational use by the intended users.

From need/problem identification, to product design, and to process and outcome evaluation, research is built into the R and D projects; it is deliberately designed to provide feedback to the product developer, on which revision of the product can be based. This feedback-revision cycle continues until it is established that the product is able to achieve its objectives.

For illustrative purposes, let me briefly present the sequence of steps and activities that lead to the development of educational products at INNOTECH.

1. Determining What Projects to Undertake/Selecting the Products to be Developed

In the Regional Conference on Review of Medium-Term Educational Needs of SEAMEC Member Countries convened by SEAMES on 25-30 October, 1978, general themes and related broad areas of concern were identified, one of which was *Education for the Improvemnt of Quality of Life with Special Emphasis on the Poor and Deprived of the Rural and Urban Areas*.

In line with the above priority area of SEAMEO and in its desire to share in the mounting world concern over the plight of the poor, INNOTECH decided with the approval of its Governing Board to undertake an R and D project on the *Development of a Coordinated Educational Intervention System for Improving the Quality of Life of the Rural Poor Through Self-Reliance*, otherwise called Project DELSILIFE.

2. Research and Information Collection

Once the research topic is firmed up and the nature of the educational product tentatively identified, a review is made of research findings and other information relevant to the planned development. As in basic and applied research, one purpose of the literature review is to determine the state of knowledge in the area of concern. Moreover, in R and D projects like the INNOTECH projects, the research staff is also concerned with how this knowledge can be applied to the product it wants to develop.

3. Planning

After having obtained comprehensive research and other pertinent information on the educational product/project to be developed, INNOTECH proceeds to the planning stage of the R and D cycle. In the conceptualization of its R and D projects, INNOTECH generally gets the thinking of available experts.

A considerable amount of time is devoted to the formulation of a sound and realistic plan. By its very nature, educational product planning and development is a continuous process. As the development work progresses, the research staff may discover areas in which initial planning was insufficient or in error. A replanning is then undertaken and necessary modifications introduced.

4. Development of the Preliminary Form of the Product

After the initial planning has been completed, the next major step undertaken by INNOTECH is developing a preliminary form of the educational product that can be field tested.

Examples of significant educational products developed or to be developed by the different INNOTECH R and D projects are as follows:

Project IMPACT : Pedagogical processes like self-instruction, programmed teaching, tutoring and peer group learning.

Project NTR : Critical teacher behaviours identified for major innovative programmes in the SEAMEO Region.

Project DELSILIFE : An educational intervention system designed to improve the quality of life of the rural poor, the components of which are:

a . A learning package model which includes needs assessment, a basic didactic framework, and evaluation techniques/instruments.

b . A basic learning package on how to mobilize and train villagers and on how to monitor learning programmes and other quality-of-life improvement activities.

The aforementioned educational products also include questionnaires, interview guides, process analysis forms, etc. to be used in field testing. After these are developed, the research staffs are trained in their use.

An important principle followed by INNOTECH as it develops the preliminary form of an educational product is to structure the product so as to permit obtaining as much feedback as possible from the field test. Thus, the preliminary forms of the INNOTECH products include many more procedures for evaluation than will be included in the final product.

5. Field Testing and Revision

The field testing or tryout of the INNOTECH educational products has two purposes: (1) to obtain information to be used as a basis for revising/improving the product, and (2) to determine whether the product being developed has achieved its performance objectives. For the first purpose, the emphasis is on a qualitative appraisal of the product and for the second, on a quantitative appraisal of outcomes that result from the use of the product.

To help ensure that the objectives of the field testing are achieved and the necessary product revisions are effected, the INNOTECH Center Staff conducts technical assistance visits to the project sites. Moreover, consultative meetings are held at crucial points in the research and development process during which the work is reviewed; a replanning is done, if necessary; and ways to efficiently carry out the plans are discussed.

Field testing and product revision are repeated, as needed, until the educational product has achieved its performance objectives. Once the product revision is completed, it becomes ready for "packaging", i. e., putting together into a compact collection all the materials needed to put the product into operational use. This entails the inclusion in the package of a model of the product, manuals, slide tapes, evaluative devices, and others, in addition to the main product.

Problems and Issues in Educational R and D

Two types of problems have been identified: the first concerns product

development; the second relates to dissemination and implementation upon completion of product development.

1. Product development-related problems

The first difficulty, which is basically a research concern, is the seemingly wide gap between findings of basic and applied research and related information, on one hand, and the type(s) of information needed in designing an INNOTECH educational product, on the other hand. Rarely do we find a set of findings that adequately meets the information requirements of the product design. For example, for Project DELSILFE, there is a need for research findings on the conditions of the rural poor as perceived by them and constraints and inhibitors to the improvement of their quality of life. INNOTECH therefore had to undertake an 18-month survey (Phase A) to obtain in a people-to-researcher interaction the information needed to develop the educational intervention system.

The second problem concerns obtrusiveness/reactiveness of measures used in research, e. g., the use of questionnaires, scales, interviews, and other self-report measures, and the attendant problems concerning internal validity. This is especially true when the research subjects know and are aware that they are a part of a study as they complete questionnaires or take tests. Almost always the "reactive measurement effect" distorts and confounds the study findings.

To deal with this problem, INNOTECH started to use unobtrusive measures (e. g., observations, informal interviews, social indicators, thematic investigations, archival records, physical traces) together with obtrusive ones in its R and D projects, resulting in multiple data sources and sophisticated rigor, a phrase intended to describe "any and all (researches) which employ multiple methods, seek out diverse data sources, and attempt to develop behaviourally grounded theories." (Densin, 1978: 167)

A problem related to the foregoing is the polarization of researchers, including the INNOTECH Research Staff, into "two cultures" (to borrow C.P. Snow's term) within a single research community. The first "culture," the more dominant one, adopts the natural science paradigm of hypothetico-deductive methodology. This dominant paradigm postulates that quantitative measurement, experimental design, and multivariate, parametric statistical analyses are the components of the model of true scientific research. The second "culture" avails of the holistic, inductive and anthropological paradigm to predict social phenomena. This paradigm relies on qualitative data, holistic analysis, and description of situations, events, people, interaction and observed behaviours. In our researches at INNOTECH we try to reconcile these two research "cultures" by using both quantitative and qualitative research methodologies and checking the consistency of findings generated by the two methods through a strategy called by Patton (1980) as methods triangulation.

There is also the problem concerning research and development expertise.

Although most staff members of INNOTECH R and D projects are technically qualified to conduct research, both basic and applied, the lack of expertise in product conceptualization, designing and development is more real than apocryphal. Ideally, INNOTECH projects should have researcher-developers with a solid foundation in both aspects of the R and D effort.

Another problem is the language barrier. Using English as a medium of communication between and among the research staff of INNOTECH R and D projects does not entirely overcome this difficulty.

2. Dissemination and Implementation Related Problems

One issue which INNOTECH has found difficult to resolve is that of authority. While INNOTECH has the moral responsibility to get an innovative educational product implemented, yet it has no line authority over Ministries of Education. Even if a Memorandum of Agreement between INNOTECH, on one hand, and the different Ministries, on the other hand, stipulates that the latter will avail themselves of the educational product of the former if it is found effective, the fact is that educational reforms are not decided solely on the basis of the functionality of an innovation or educational product. Educational policy decision-making is the result of an interplay of political, economic, social and cultural forces.

This is not to say, however, that certain mechanisms do not now exist that are designed to ensure support for and eventual utilization of a research product. The Governing Board of INNOTECH is composed of ministerial decision-makers and the Chairmen of the DELSILIFE national steering committees are a Director General and Deputy Ministers of Education in their respective countries.

But even this has not remedied the situation enough. Aware of this problem, the Frist INNOTECH Biennial Seminar held in Manila, Philippines in July 1982 recommended strongly that INNOTECH devise means to remedy this situation.

Programme priority also poses a problem. Because governments operate on long range plans, specifying the programmes to be undertaken during the targetted period with the corresponding budget allocation for each, the probability of an educational product or innovation getting implemented, much less institutionalized in the educational system, is almost nil if it is not provided for in the plan.

Not to be discounted is the issue related to cultural values. In a tradition-bound, elitist community where quality education is equated with high-rise school buildings and sophisticated instructional materials, an innovation like IMPACT, which uses learning kiosks instead of standard classrooms and mimeographed modules in lieu of factory-printed textbooks, is not likely to be regarded with favour. It takes years to develop values and it takes many more years to unlearn or change deeply-rooted ones. In effect, this traditionalism operates as brakes on innovation or product implementation, although an imaginative packaging and systematic dissemination of the innovation could help overcome this resistance.

The last problem, which is an important concern of INNOTECH at present, is on the absence of a research based model for the dissemination and utilization of innovations, a model that takes into account the unique characteristics of the Asian societies. It is sad to note that in the absence of an indigenous regional model, several educational products or innovations are gathering dust in the bookshelves of Ministries of Education. Their nonutilization may not be due to the innovations' ineffectiveness; rather, it may be because of lack of a research-based, tested model for disseminating innovations.

For this reason, INNOTECH has developed recently a research proposal entitled "Process Models for the Dissemination of Innovations." Hopefully, these models will fill in the information gap in regard to dissemination and utilization of educational products or innovations in the SEAMEO Region.

Following are some R and D projects which may be addressed directly or indirectly to educational content and methods which this workshop is specifically concerned with:

1. Using Indigenous Learning Systems to Improve the Quality of Education in Deprived Communities.
2. Development of Science and Technology Education for Environmental Improvement and Socio-Cultural Aspects of Science and Technology.
3. Development of Training Programme for Change Agents Who Work in the Rural Communities.
4. Development of Process Models for Adapting Curriculum to Development Needs.
5. Development of Model(s) for Affective Learning.
6. Development of Process Models for the Dissemination of Innovations.

Concluding Statements

Those who have undertaken educational R and D projects will, I think, agree with me that the activities involved are far from simple to carry out. Many false starts and setbacks in developing the educational product are expected. Many more frustrations are experienced later when the finished educational product ends up in the dusty shelves of libraries. "What's wrong?" we might ask. We have to find out. As of now, let us console ourselves with the fact that, as one noted researcher-evaluator aptly observed, "research impacts in ripples, not waves."

References

Asher, J.W., *Educational Research and Evaluation Methods*, Boston, Little Brown and Co., 1976.

Borg, W.R. and Gall, M.D., *Educational Research: An Introduction* (Second Edition), New York, David Mckay Co. Inc., 1976.

Clark, D.L. and Guba, E.G., *An Explanation of Potential Change Roles in Education*, October, 1965, 33 p. (mimeo)

Denzin, N.K., *The Research Act*. New York, McGraw Hill, 1978.

Gagne, R.M., *Educational Research and Development: Past and Future*, In R. Glaser (ed.) *Research and Development and School Change*, Hillsdale, N.J., Lawrence Erlbaun Associates Publishers, 1978.

Gideonse, H.D., *An Output-Oriented Model of Research and Development and its Relationship to Educational Improvement, Journal of Experimental Education*, 1968, 37 (1), 157-163.

Klausmeier, Herbert J. and O'Hearn, George T. (eds.), *Research and Development Toward the Improvement of Education, Journal of Experimental Education*, 1968, 37, 1-163.

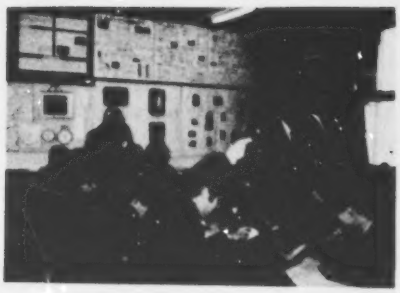
Patton, M., *Qualitative Evaluation Methods*. Beverly Hills, Calif., SAGE Publications, Inc., 1980.

Tyler, R.W., *Prospects for Research and Development in Education*. Berkeley, Calif., McCutchan Publishing Corp., 1976.

Tyler, R.W., *How Schools Utilize Educational Research and Development*, In R. Glaser (ed.) *Research and Development and School Change*, Hillsdale, N.J., Lawrence Erlbaun Associates Publishers, 1978.

Appendix IV

VISIT TO SAKAIDE LOWER SECONDARY SCHOOL ATTACHED TO KAGAWA UNIVERSITY



The participants of the workshop were given an opportunity of observing one of the attempts made at the school level for the improvement of instructional content and methods as an experimental project authorized and designated by the Ministry of Education. It is a kind of educational reform action being tried out and worked out at the school level which may give a new thought in formulating educational reform policies at the national level in the long run.

The Sakaide Lower Secondary School was established in 1947. It now has twenty teachers and four support staff under the management of a principal and a vice principal. Four hundred and three students composed of two hundred and twenty two girls and one hundred and eighty one boys are enrolled. The school is attached to the Department of Education of Kagawa University and serves as a laboratory to those students studying education.

At the moment, the school is involved in an experiment known as *the Modular Flexible Schedule* which has been experimented since 1979. It was initiated on the premise that students learn best in an educational environment where their time and individual talents are utilized and developed. The programme adopts an individualized approach to instruction and educational experiences are designed to help students handle responsibility.

Some important features of the programmes as observed by participants included the following:

1. **A Broad Curriculum**: Study sessions were divided into compulsory and elective courses. The former are courses intended to develop basic and essential knowledge and skills and must be completed by all students. The latter group of studies are intended to develop the individual character of students and designed according to student interests and needs. The courses provided were in such areas as Japanese Language, English, Music, Physical Education, Science, Social Studies, Mathematics, Arts and Handicrafts, and Home Economics.
2. **Instruction**: Morning sessions are allocated to compulsory courses and three afternoons per week are devoted to the elective studies. Learning modules vary in length according to their purpose. Some drill activities are very short while laboratory work and practical activities are much longer in duration. Instruction is given in big groups, in small groups and where necessary to individual students.
3. **Grouping**: Students are grouped to facilitate the instructional process. For compulsory courses students are grouped according to past performance and achievement, to test results, and to personal factors like learning habits and motivation.
4. **Evaluation**: The evaluation of the elective programme involves two basic aspects: self evaluation by students and teacher evaluation. Studetns evaluate their own progress using categories such as general attitude, contribution to group work and extent to which he or she has worked to capacity. Teachers

validate such evaluations. On the basis of such assessments subsequent modules are given.

5. **Facilities**: The school provides a range of excellent facilities including a garden for science learning, gymnasium, and a very sophisticated audio technology laboratory.

Viewed from the objectives of the workshop, participants felt that the visit was a very significant phase of the whole programme because it gave meaning and relevance to the exchange of experiences during the workshop sessions. It also gave insights on the impact of technology on the implementation and evaluation of educational reforms.

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